STATE WATER RESOURCES CONTROL BOARD

PUBLIC HEARING ON AMENDED JOINT PETITION OF THE IMPERIAL IRRIGATION DISTRICT AND THE SAN DIEGO COUNTY WATER AUTHORITY FOR APPROVAL OF A LONG-TERM TRANSFER OF CONSERVED WATER PURSUANT TO AN AGREEMENT BETWEEN IID AND SDCWA, AND APPROVAL OF CHANGES IN POINT OF DIVERSION, PLACE OF USE AND PURPOSE OF USE UNDER PERMIT NO. 7643 (APPLICATION 7482).

TUESDAY, MAY 14, 2002
9:00 A.M.

BONDERSON BUILDING
SACRAMENTO, CALIFORIA

REPORTED BY: ESTHER F. SCHWARTZ
CSR 1564

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SACRAMENTO, CALIFORNIA

TUESDAY, MAY 14, 2002, 9:00 A.M.

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CHAIRMAN BAGGETT: Let's go back on the record.

We will begin with the Defenders' case in chief.

MR. FLETCHER: Good morning, Chairman Baggett. My name is Brendan Fletcher, and I'm here on behalf of Defenders of Wildlife, a conservation organization with over 100,000 members and supporters in the State of California.

This opening statement was prepared in consultation with the Planning and Conservation League, National Audubon Society of California, National Wildlife Federation and Sierra Club California. And those groups concur in the statement.

Our primary objective in our case in chief is to directly address the question posed by the Board for Phase II of this hearing: Will this transfer have an unreasonable impact on fish, wildlife and other instream beneficial uses. The transfer parties have failed to demonstrate that this transfer will not have such unreasonable impacts. Conversely, the evidence presented in our case in chief as well as the evidence presented by other parties will demonstrate the transfer will have unreasonable impacts on fish, wildlife and other instream beneficial uses, if the transfer is structured as currently proposed.

In addition the evidence will show that the transfer will have adverse impacts on air quality, water quality and human health in the Imperial and Coachella Valleys, impacts which implicate the Board's obligations as a responsible agency under the California Environmental Quality Act and its broad authority to take measures to protect the environment under Article X, Section 2 of the California Constitution and Water Code Sections 100 and 275 and the Public Trust Doctrine.

The application before the Board proposes a transfer of up to 300,000 acre-feet of water from Imperial Irrigation District to San Diego County Water Authority, Coachella Valley Water District and/or Metropolitan Water District. The current proposal is to generate that water through a combination of improvements to the irrigation system of IID and on-farm conservation.

As would be expected for a project of this scale and complexity, the transfer will have significant impacts on natural resources and the environment throughout Southern California. There will be impacts on the Colorado River from the change in points of diversions. The transfer will have growth inducing impacts in San Diego County Water Authority's service area, which will have an adverse impact on fish and wildlife in San Diego County.

Most dramatically the transfer will have an enormous,

perhaps irrevocable, impact on the Salton Sea and the environment in the Imperial County. The decision on this transfer is also a critical decision point for the Salton Sea and the shape of this transfer could determine the future of the Sea.

The Salton Sea is currently an environmental and recreational resource of the utmost importance, a resource of statewide and national significance. The Sea supports an extraordinary recreational fishery, one of the most productive anywhere and one that has no peer in Southern California. The Sea and its environment provide habitat for more than 400 bird species, including several threatened and endangered species, making it one of the most important spots for birds along the Pacific Flyway.

If the transfer is approved as proposed, the prospects for sustaining and restoring resources at the Sea are grim. For every acre-foot of water transferred from IID an acre-foot will be lost to the Salton Sea. At full ramp up inflows to the Sea will be reduced by approximately 300,000 acre-feet, nearly one quarter of the Sea's current inflows. The surface area of the Sea may shrink by as much as 50,000 or more acres.

The evidence will show that the transfer could set in motion a process of rapid ecological collapse of the Salton Sea. Reduction of inflows will greatly increase the rate of

salinization of the Sea, with immediate adverse impacts on the fisheries there. Although the Salton Sea fish are currently stressed by the Sea's salinity, nonetheless it is estimated the Sea could support fish for as much as another 50 years if inflows remain constant. With the proposed transfer and the actions it would trigger, the Sea could become too saline to support fish in a little more than a decade.

With the decline of fisheries there will be a drastic decline in the astounding bird populations at the Sea. When the fish go, so will the white pelican, brown pelican, black skimmer and other fish eating birds. And those birds that do not depend on fish for sustenance may encounter difficulties as well as the conditions for invertebrates at a hypersaline Salton Sea will differ substantially from those at Mono Lake, which is often held up as a model of the lake that can sustain large numbers of invertebrates and invertebrate eating birds.

The decline of the Sea as a natural resource will also mean its decline as a recreational resource and all that means economically for Imperial County. Currently as many as 400,000 anglers fish at the Sea every year, and they enjoy enviable catch rates. As the Sea shrinks it will become less attractive to other recreationists and campers who currently enjoy seaside campsites, the sightseers who

admire some of the most beautiful vistas and spectacular sunsets in the California desert.

Not only that, the transfer may well eliminate the possibility of restoring the Salton Sea. As the Salton Sea Authority has already testified, restoration may become technically and financially impractical if inflows are reduced by 300,000 acre-feet.

But let's assume against the odds that the transfer goes forward just as it is proposed, inflows to the Sea decline, but a technical solution is somehow found that will sustain resource values at the Sea, and state and federal funds are committed to implement that solution. Does that mean everything is okay? Unfortunately, it doesn't.

As the Regional Water Quality Control Board's testimony showed yesterday, selenium will be concentrated within IID's drains as runoff in the fields increase. Those increased concentrations will pose a hazard to whatever wildlife remains or habitats are restored to the Sea. As our testimony will show, exposed seabed can cause dust emissions comparable to those at Owens Lake, and the mitigation that will inevitably be required for air quality problems of this magnitude could cost hundreds of millions of dollars. It is not only the environment of the Salton Sea that is threatened by this transfer.

Of course, in theory it might be possible to mitigate

for these impacts. However, the mitigation proposed -- the measures proposed in the transfer EIR fall into two categories: inadequate and the improbable. The current major mitigation proposal for fish and wildlife impacts clearly preferred in the EIR is HCP Alternative 1.

This alternative is a proposal to provide hatcheries and fish ponds adequate to support a portion of the fish eating birds that have relied on the Sea for 75 years. The testimony to come will show that this proposal is riddled with unanswered question, technically flawed, and it is still unfunded. The proposal is also designed to mitigate for impacts to threatened and endangered species only. The EIR provides no mitigation for other significant impacts of the transfer, such as recreational fishing and air quality from seabed exposed by the transfer.

On the other hand, HCP Alternative 2, which could provide the Sea with water to make up for reduced inflows by fallowing land, would minimize or eliminate many of the most severe environmental impacts of the transfer. If HCP Alternative 2 were adopted or if the transfer were simply implemented by a fallowing, as in project Alternative 4, our concerns would likewise be minimized. However, it is clear from the testimony offered in both phases of this hearing that the Imperial Irrigation District has no intention of adopting HCP Alternative 2 or project Alternative 4.

So to sum up, the transfer will degrade the Salton Sea as a fish, wildlife and recreational resource and possibly preclude its restoration, worsen the water quality problems in the drains and rivers of the Imperial Valley and impair their beneficial uses, and potentially cause severe dust storms in the Imperial and Coachella Valleys.

Nevertheless, the transfer parties suggest that somehow these are reasonable impacts when viewed in the context of this transfer's importance to California in reducing its reliance on Colorado River water.

In Phase I we heard testimony that the Bureau of Reclamation's interim surplus guidelines are contingent upon execution of the Quantification Settlement Agreement by the end of this year. We heard testimony that the guidelines will be suspended and Southern California will lose its access to surplus Colorado River water if the QSA is not timely executed. And we heard that this transfer will, as a practical if not a legal matter, set a precedent for future large scale water transfers.

In essence, the transfer parties argue that this transfer is so important and the consequences of failure some dire that the transfer must go forward irrespective of environmental impacts.

We support the objective of reducing California's reliance on surplus Colorado River water. We are aware that

the Interim Surplus Guidelines appear to be contingent upon the QSA, although it also appears that California could meet at least the first and possibly the second benchmark of those guidelines with existing programs, suggesting that the deadline may be less inflexible than it appears at first glance.

We certainly agree that the water community, including environmental stakeholders in that community, will look to this transfer for an example of what is to come. But we cannot agree that this transfer's importance for Southern California's water supply is any reason to disregard or minimize the impacts to the environment. The opposite is the case. The significance of issues and high profile of this transfer make it all the more important that its environmental consequences are dealt with up front and completely. The reliability and long-term predictability that both IID and San Diego seek will not be achieved if its transfer leaves for another day the job of developing mitigation measures for fish and wildlife, water quality and air quality impacts whose costs run into the hundreds of millions of dollars.

Looking at the broader water quality implications for California, if transfers are to play an important role in assuring California's future water supply, they must be seen as an efficient, environmental friendly way to maximize

water supplies. Urban water agencies, agricultural communities and environmental stakeholders will have no desire to imitate this transfer if its legacy is a degraded Salton Sea and chronic air quality problems in the Imperial and Coachella Valleys.

Given the importance of the issues at stake, both for the environment and the water supply of California, it is critical that this transfer must be a model worthy of imitation. So what would a model transfer look like? Well, it must comply with all environmental laws. It would need to preserve the possibility of restoring the Salton Sea, and must not degrade the air quality of the Imperial and Coachella Valleys or lead to water quality problems in drainage waterways. A model transfer would need to address third-party impacts in the area of origin and growth enducing impacts at the point of delivery.

The proposal before the Board does not meet these standards. What is needed is time to develop a Salton Sea restoration plan, to model potential air quality impacts under different scenarios, develop information on third-party impacts under different scenarios. In an ideal world this solution would be simple: put off the transfer, develop the needed information and proceed only when all impacts are understood and measures to avoid or to mitigate for those impacts are funded and ready for implementation.

However, unless a way is found to alter the QSA and the Interim Surplus Guidelines, that does not appear to be a viable alternative.

In the absence of time, the transfer must be structured to cause no significant harm to the resources of the Salton Sea and the environment in the Imperial and Coachella Valleys in the short term so the solutions can be developed to protect those resources over the long term.

The evidence shows that the only way to do that at the present time is by fallowing land. We request that the Board approve this transfer only upon the condition that it cause no reduction in inflows to the Sea, at least in the short term. There is several ways this could be accomplished. The Board could issue a conditional approval for the full term of the transfer and retain jurisdiction to alter conditions in the event a Salton Sea restoration plan is adopted and funded and plans to control air quality and water quality impacts to the drain are developed, funded and ready for implementation.

Alternatively, the Board could issue a temporary conditional approval for the transfer to expire on December 31, 2007, or some other appropriate date, in a manner similar to that recommended by the Pacific Institute. Either way, conditional approval will be contingent on the parties' enforceable commitment to implement the following

elements during the period of approval:

The water transferred during the period of approval could be generated only by the voluntary fallowing of land, such that inflows to the Sea are unaffected by the transfer. If the condition -- in the initial years of transfer such voluntary fallowing would address farmers' needs for financial predictability, and the amount of land needed to fallowed would be smaller than at peak periods, reducing socioeconomic impacts.

The approval would need a condition that there be a plan developed with broad-based community participation to invest an appropriate percentage of the transfer revenues into a community development funds to mitigate for the socioeconomic impacts in Imperial Valley.

The conditions would include a plan to develop broad-based community participation to identify and address the growth inducing impacts of the transfer within the service area of San Diego County Water Authority.

And there would be a condition of participation in a process, that the transfer parties participate in the process in conjunction with the federal and state governments and the Salton Sea Authority and in consultation with a broad range of stakeholders to develop and implement a long-term restoration plan for the Salton Sea.

Such a conditional approval would enable California to

meet the terms of the federal Interim Surplus Guidelines. It would avoid environmental impacts on the Salton Sea by holding inflows at the level the Sea would receive in the transfer's absence, and it would minimize water quality impacts in the drains, air quality impacts in the Salton Sea Basin and growth inducing impacts in San Diego. Any revised proposal to confirm with such conditional approval will probably need additional environmental analysis to ensure that there are no unanticipated consequences. But based on our current knowledge, impacts should be minimized.

In addition, a conditional approval would afford time to develop reasonable, sustainable mitigation for impacts a longer term transfer may have on fish and wildlife, water quality and air quality. The state and federal governments would have a reasonable period in which to develop a long-term sustainable restoration plan for the Salton Sea. If such a plan is adopted and ready for implementation, transfer parties could receive approval to generate conserved water by any method so long as the impact on inflows to the Salton Sea is consistent with the restoration plan. This would create an incentive for the transfer parties to direct their effort towards encouraging the state and federal governments to develop a workable plan.

We recognize in requesting conditional approval that a long-term transfer is an important piece of a historic

effort to resolve decades of disputes over the Colorado River water. But the potential for environmental loss of the Salton Sea is of equal historic significance, environmental loss of portions that bring to mind some of the darkest chapters in the history of California water use: Potential for dust clouds comparable to those caused by the dewatering of Owens Lake; Selenium contamination that evokes Kesterson.

This transfer should not and need not be responsible for such staggering environmental degradation. We believe that with time, resources from the state and federal governments and the concerned effort of all stakeholders, California can restore the Salton Sea, protect the environment of the Imperial and Coachella Valleys and reduce its reliance on Colorado River water.

However, that will not be possible if inflows to the Sea are sharply reduced in the near future. We request that you find the current transfer proposal has unreasonable impacts on fish and wildlife, recreational uses and public trust resources, and condition the transfer as described previously to avoid those impacts.

Thank you.

CHAIRMAN BAGGETT: Thank you.

MS. DOUGLAS: Karen Douglas with Planning and Conservation League. Planning and Conservation League

concurs with the opening remarks of Mr. Fletcher, Defenders of Wildlife.

On behalf of PCL, though, I would like to emphasize a number of points. First of all, as we have said before, Salton Sea is a unique, irreplaceable and really spectacular natural resource. And the evidence will show that the Salton Sea is of vital importance to many bird species. It will show it is the crown jewel of biological diversity and recreational resource of great value in a region with very limited aquatic recreational resources. The evidence will also show that the Salton Sea is a world class sports fishery and that, in fact, anglers are among the most passionate defenders of the Sea, and you will meet two of these anglers today.

Second, the evidence will show that the Salton Sea is a public trust resource. The Salton Sea is not artificial and it is not an accident. It is true that today the Sea is sustained by agricultural runoff. However, it was -- there's been a lake. The evidence will show that there has been a historic lake in the Salton Basin over at least the past half million years. Now that we have dammed and regulated the flow of the Colorado, it is not likely to turn back into the Salton Basin. But the Salton Sea is there as a reminder of days when the Colorado River was undammed, and it is there as a reminder and represents the last time that

the free flowing Colorado inundated the Salton Basin.

Archeological and other records suggest that the river might have flown into the Salton Trough more often than it flowed into the Gulf of California over the past two millennia. And evidence will show that at the time the Spanish explorers claimed North America for Spain, the Salton Trough was inundated. When California became a state, the Salton Trough moved water in the Salton Sea. The Salton Sea has historically been part of the Pacific Flyway and the Colorado River Delta system, and it is an important public trust resource today.

Third, the evidence will show that the potential impacts of the proposed water transfer, if it goes forward through on-farm conservation, are catastrophic. We are going to put on evidence that the concentration of salts and chemical contaminants in the Sea under reduced inflow scenarios will cause ecological havoc and collapse at the Salton Sea, affecting all levels of food web from microorganism to fish and fish eating birds.

The transfer, if it goes forward through on-farm conservation will also affect the bird and fish species that use the drains and agriculture fields.

Fourth, despite the bland and unsubstantiated assurances in EIR/EIS, there is no evidence in the record to date that the Sea will naturally transition into a Mono Lake

type ecosystem if the transfer goes forward. On the contrary, we are going to put on evidence that, and it should be obvious, that the Salton Sea is not Mono Lake. And the evidence will show that ecological processes and end points at the Salton Sea could be and, in fact, are significantly different from Mono Lake.

And my final point is air quality. And fortunately nobody here at this hearing has yet questioned why the State Water Quality Control Board has to be concerned about air quality. The Board probably does not need a reminder as to why air quality is an important issue when we talk about dried up saline lakebeds and PM-10. However, I would like to elaborate on these points very briefly for the record.

The state -- in the past, the State Water Board approved diversions from Owens Lake in 1913 and again in 1970. We will put on evidence as to the terrible air quality impacts that that had. Of course, the ecological value of Owens Lake were completely obliterated. These problems are now being resolved, but the process of resolving them are long and painful, and it is costly. There is remediation work going on and very costly to Los Angeles, hundreds of millions of dollars. Water has to be put back into the lake, a lot of water is being put back into the lake, and there were years of litigation and years of health problems for residents in the surrounding areas

and years, many years of economic devastation of the entire community.

State Water Board also approved the diversions from the tributaries of Mono Lake, the diversions that began in 1941. Again, we have a history of very serious air quality problems, very serious biological effects that could have been catastrophic for the Mono Lake ecosystem. Many people in this room know very well the Mono Lake situation actually went all the way up to the California Supreme Court before coming back to this Board in 1994, where this Board set minimum inflow requirements in the tributaries, limits on water exports from the lake and ordered habitat restoration and other important measures.

Again, the situation was ultimately resolved. But it happened at great cost in money, years of litigation. It took water, putting water back in the lake. And it was potentially not necessary to go through all of that, to come back and decide in the end that they have to put water back in the lake because the environmental costs of the project, the way it was originally proposed and approved were too high.

Finally, in the spring of 1996 the State Air Resources Board adopted the second phase of the reformulated gasoline program, requiring oxygen in the gas without adequate analysis on the water quality effects of MTBE, which, of

course, is one of the most common additives that was put in at that stage. And the State and this Water Board are now having to grapple with the result of that problem. It is going to be costly. It is going to take a long time to fix, and we are going to be living with environmental impacts for a long time before we resolve the situation.

So with these recent chapters of environmental policy in mind, I would like to make my final point. And that is PCL is very concerned with the implication of the argument that some parties seem to be making in this proceeding, that somehow because we have deadlines for the 4.4 agreement, which we do, and because the transfer is very important to the state, which it is, that somehow this transfer should be jammed through without adequate environmental analysis and in the face of strong evidence of serious environmental problems.

We hope that this will not ultimately be the case, and we really greatly appreciate the opportunity that we've had to air our concerns and put on evidence of the problems that we see before this Board and at this stage in the process. That concludes my opening statement.

Thanks.

CHAIRMAN BAGGETT: Thank you.

Can we have your first panel of witnesses?

MS. DOUGLAS: Yes, please.

DIRECT EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY MS. DOUGLAS

MS. DOUGLAS: I will begin with Dr. Tim Krantz.

When we come to a slide that is not already in evidence, I will just note that and we will submit slides later. There are very few slides. Most of the slides are present in Salton Sea Exhibit 1, or PCL Exhibit 1, which I handed out.

To begin, Dr. Krantz, will you please explain your qualifications to testify on Salton Sea?

DR. KRANTZ: My name is Dr. Tim Krantz. I am the Director of the Salton Sea Database Program, which is a Congressionally funded independent information clearing house administered through the USEPA.

MS. DOUGLAS: Do you recognize the document before you labeled PCL Exhibit 22? That is your testimony.

DR. KRANTZ: The testimony, yes.

MS. DOUGLAS: Are there any changes or corrections you would like to make to your testimony at this time?

DR. KRANTZ: Yes, a couple changes or clarifications. Number one, there is a statement under the fisheries and biological resources that estimates there are 200,000,000 fish in the Sea. That is a high end estimate by Dr. Barry Costa-Pierce and Ralph Riedel. They have put it in a range of 48- to 200,000,000, I will explain a little bit more

about that later.

More importantly, we have revised statistics on the drawdown and the exposures of land based on an evaporation of 5.78 that correspond to 300,000 acre-feet, corresponds to a drawdown elevation of 19 feet, exposing 53,900 acres. That is 84 square miles.

With a 500,000 acre-foot reduction of inflow, sea level drops by 30 feet, exposing 88,500 acres. That is 138 square miles. That is the only changes.

MR. OSIAS: Could you tell us where those would be, what statement? What page is that?

MR. SLATER: Page 6, if you look at six.

MR. OSIAS: Thanks.

MS. DOUGLAS: Your academic background, you're a geographer?

DR. KRANTZ: I am a geographer with a Ph.D. in physical geography from the University of California at Berkeley.

MS. DOUGLAS: To begin with, can you tell us about the geographic setting of the Salton Sea?

DR. KRANTZ: Yes. The Salton Sea is California's largest lake. It lies in a closed basin, a watershed draining 7,851 square miles with no outflow to the open ocean. The surface area at elevation of 227 feet below sea level is 367 square miles. That is approximately 35 miles long, 15 miles wide yet only 51 feet deep. That is

equivalent to a football field, a pool and a football field one inch deep. That renders it very sensitive to even slight changes of inflow.

MS. DOUGLAS: What is the geologic history of the Salton Sea and Salton Basin?

DR. KRANTZ: I will step back approximately 12,000,000 years ago when the Salton Basin was connected to the Gulf of California. Sediments from the Colorado River began to build a large delta. Literally the sediments that filled the Grand Canyon have created a deltaic berm or dam which eventually closed off the Salton Basin from the Gulf of California, establishing a closed basin. Periodically as is the nature of alluvial deltas, the river would drain directly to the gulf, drying out the basin or would meander into the basin, capturing the entire drainage and filling the Salton Trough to the watershed drainage divide which is approximately 17 miles south of Mexicali.

At this point the Salton Basin, called Lake Cahuilla for these periodic episodes, overflows Lake Cahuilla and drains to the Gulf of California, like a giant oxbow to the Colorado River.

These cycles of drying and infilling have persisted for tens of thousands of years and into modern times, as late as the 1800s until finally the historic time, which we will talk about a little more later, and the Sea today sustained

by agricultural runoff.

MS. DOUGLAS: Would you say that the lake was full more often than not?

DR. KRANTZ: Yes. There are substantial bodies of evidence that point towards the periodicity of Lake Cahuilla. There are travertine deposits on the surrounding mountain sides. These are carbonate deposits like a bathtub ring in your tub. These yield carbon dates that can give us an idea of the periodicity of Lake Cahuilla. Also, around its shores we find archeological evidence of fish traps, organic remains and also carbon dating.

This Dr. Jerry Schaefer, who is probably the world authority on carbon dating in the basin, he's generated a graph that shows the periodicity for the last 1300 years, in which case Lake Cahuilla, as you can see, was full more often than not.

MS. DOUGLAS: What were some of the Native American uses of Lake Cahuilla?

DR. KRANTZ: These are some other corroborating lines of evidence, by the way. Packrat middens, tree-ring chronologies, flow rates on the river.

The Native American evidence is mostly comprised of fish traps and fishing remains, organic remains of weirs and nets where they would actually build these rock traps out into the water and then put a net across the gate and scope

the fish out.

MS. DOUGLAS: Are you familiar with 19th century accounts of Lake Cahuilla?

DR. KRANTZ: Yes. The historic accounts began in the early 1800s with our first good historical records. There were accounts of the USGS teams looking for the southern transcontinental railroad. In 1849 through 1852 there was a large partial inundation, a series of seven or eight inundations in the 1800s, leading to the 1905 flood.

MS. DOUGLAS: Sorry, out of order.

Can you go back to the formation of the modern Salton Sea? Would you say the Sea is natural or artificial, and does it matter?

DR. KRANTZ: Actually, this slide will speak to that fairly well. The flood of the Colorado River occurred while those working on the agricultural diversion channel, which had filled up with sediments after a period of dry years, were digging a new channel south of the border, and the river was in flood and it captured that channel, eventually downcutting into the alluvial fan, capturing the entire drainage of the river for the next two years until it could be filled.

MS. DOUGLAS: Can you speak to or -- are you done?

DR. KRANTZ: Yeah.

MS. DOUGLAS: Can you -- let's go on to the biological

resources of the Sea.

DR. KRANTZ: As has been mentioned in the opening briefs, the Salton Sea is a tremendously rich area in biological resources. Other speakers today will speak to the abundance of the microorganisms fed by the nutrient-rich runoff which then sustains the fishery of 50,000,000 to 200,000,000 fish at 2250 kilograms of fish per hectare. This may be one of the richest, most productive fisheries in the world, those fish supporting the birds and wetlands around the sea supporting more birds, several of these being threatened or endangered species.

MS. DOUGLAS: How does the Salton Sea fishery compare with other fisheries around the world?

DR. KRANTZ: The fishery is sustained, as I mentioned, by the plankton which are these -- this is the keystone species, by the way, that supports the fishery. This is a lonely pileworm, photo courtesy of Dr. Hurlbert's group, and the Salton barnacle.

These microorganisms support the tilapia and other fish that are in the Sea. As I mentioned, these studies by Barry Costa-Pierce and Ralph Riedel, University of Mississippi, indicated that this may be, indeed, one of the most productive fisheries in the world. The only native fish, by the way, is this desert pupfish on the screen. It is only a couple inches long. This fish is evidence of Lake Cahuilla

in that it retreated during dry periods up tributary streams, such as San Felipe Creek, and then when Lake Cahuilla would fill, it would disperse back through the lake. This is an endangered -- federal and state endangered species.

MS. DOUGLAS: How important is Salton Sea to birds?

DR. KRANTZ: The Salton Sea can be likened to California's Everglades; that is, as a birder myself, I go down there and see many species that I am familiar with from the Everglades themselves, except that it rivals the Everglades by far in its diversity with more than 400 species, two-thirds of all of those encountered in the United States, 90 percent of North American eared grebes, 90 percent of the western population of American white pelicans, and so on. These numbers are staggering. The Salton Sea is of significance, great significance, not just to several species, but for many species as a whole, not just as an area unto itself.

The only site for brown pelicans nesting inland, thousands of snow geese, 45 percent of the Yuma clapper rail, also an endangered species.

MS. DOUGLAS: Where do all these birds come from?

DR. KRANTZ: They come from areas throughout North America, really. One of our other studies here found that of 20,000 bird band records -- these are leg bands that are

attached to primarily ducks and geese. These were birds banded at the Salton Sea and recovered elsewhere or banded elsewhere and recovered at the Sea.

You can see here the yellow dots -- it's kind of hard to see out there -- indicate where these birds are coming from or going to. And if I can point out to you with this cursor, when we first looked at this we expected the Pacific Flyway to be well illustrated, and it is. What was surprising was a great many of the birds go from the Salton Sea to the Great Salt Lake and then nest in the Prairie Pothole country of Southern Canada and the North Central Plain states, and the next winter they, as likely as not, migrate down to the Gulf of Mexico and back and forth.

We had 85 bands recovered from the wilderness of the Arctic north slope, Nunavut, the Arctic islands of Canada and Northern Alaska. We had 175 recoveries from Alaska, 22 from Siberia and Northern Russia and so on, three from Hawaii, 30 from Central America. The furthest was Peru. One wayward bird from New Jersey.

MS. DOUGLAS: What are some of the economic values tied to the Salton Sea?

DR. KRANTZ: The Salton Sea hosts a very vigorous economic resource. It's America's winter bread basket as there are no freezing temperatures in the Basin Plan, so many of the East Coast's produce comes from here during

winter months. Over 200,000 visitors annually visit the state park. That is only the visitors to the state park, 250,000 last year. We estimate that is maybe one-tenth of the visitation to the Sea. Probably over 2,000,000 visitors a year.

MS. DOUGLAS: Can you speak to the hydrology of the Sea?

DR. KRANTZ: The Sea is sustained by approximately 1.3 million acre-feet of inflow. And most of that, in fact, 77 percent of it comes from the New and Alamo River in the Imperial Valley. This is from agricultural runoff. Another 8 percent drains directly to the Sea from agricultural drains, and most of the water from the Whitewater River also is from surface agricultural inflows. So all together greater than 90 percent of inflow comes from agriculture.

MS. DOUGLAS: What is the water level under current conditions?

DR. KRANTZ: The elevation today is at about 227 feet, sustained by 1.3 million acre-feet.

MS. DOUGLAS: Below sea level?

DR. KRANTZ: Below sea level, yes.

MS. DOUGLAS: How do inflows relate to evaporation?

DR. KRANTZ: The inflow -- it is a closed basin, so inflow equals evaporation if the elevation has been relatively constant as it has been for the past decade. So

this is one way we can test the inflow relative to the evaporation rate. We found that the best fit is, in fact, 5.70 feet per year at 227 feet below sea level. That equals 1.3 million acre feet.

MS. DOUGLAS: Can you briefly explain why salinity is increasing in the Sea?

DR. KRANTZ: The inflow from Colorado River is already fairly salty compared to other rivers in the United States, six parts per thousand by the time it gets to the Sea itself. And then with no outflow to the ocean, salts are left behind by evaporation, and they concentrate, loading approximately 4,000,000 tons annually.

MS. DOUGLAS: Would you briefly explain the reduced inflow scenarios that you looked at in your testimony and then PCL Exhibit 1?

DR. KRANTZ: Yes. We've modeled the reduced inflow scenarios, and we begin with these assumptions. Now the transfer EIS/EIR assumes that the baseline elevation is 235 feet below sea level; that's seven feet lower, eight feet lower than it is today due to entitlement enforcement and other actions.

The transfers, that is equivalent to about a hundred thousand acre-foot of reduction of inflow. The transfers themselves are proposed for 300- -- up to 300,000 acre-feet, and there are several other potential reductions that we

have also modeled. The Mexicali wastewater treatment plant may result in recycling water that goes into the New River, reduction of potentially 65,000 acre-feet; salinity control. The removal of salts from the Sea itself will result in the reduction of some water in the Sea. Finally, canal lining of the Coachella and All American Canals, and their EIS/EIR also document as much as 20,000 acre-feet of reduction of inflow from that.

MS. DOUGLAS: How would these reductions in inflow affect sea level?

DR. KRANTZ: Well, we have modeled this using a grid calculation, using the bathymetry of the Bureau of Reclamation and IID inflow rates, rates quoted in the Salton Sea Restoration EIS/EIR. With these baseline conditions as I've already mentioned, this is our result. This is the Sea today at 227 feet below sea level.

Notice in the green you have the significant wildlife resource areas, rookeries and other nesting areas, nesting colonies.

If we begin with the entitlement enforcement actions dropping the Seas to minus 235, this is the resulting shoreline. At this point we have already lost Mullet Island, a key nesting island in the Salton Sea. From this point on the Sea is being reduced by 20,000 acre-feet per year. If you watch the image there, you can see down in the

left-hand corner it's going down by 20,000 acre-feet per year over the next 15 years, and notice the elevation is dropping at about one foot per 20,000 thousand acre-foot increment.

So at 200,000 acre-foot, this is the resulting shoreline. Hard to see the colors on that from my angle.

MS. DOUGLAS: Can we turn down the light so we can see better?

DR. KRANTZ: This is 300,000 acre-feet. This would be the resultant shoreline elevation at 252 feet below sea level with the full transfer beginning at the baseline elevation of minus 235.

MS. DOUGLAS: How many acres are being exposed there?

DR. KRANTZ: Well --

MS. DOUGLAS: How many miles?

DR. KRANTZ: This is for the 300,000 acre-foot reduction. That would result in -- if we took it from the existing elevation today without the entitlement enforcement actions, that is 53,900 acres, or 84 square miles.

If we add the other potential reductions, Mexicali wastewater recycling and others, that equals approximately 500,000 acre-feet of reduction. This is the result. The Sea is down to minus 263. We start to see the two subbasins. If we begin the Sea back at its existing elevation, however, of 227 and then take the 300,000

acre-feet away, assuming no initial drawdowns, this is the result. The Sea is at 243, 243 feet below sea level. That exposes 53,900 acres, 84 square miles.

MS. DOUGLAS: What happens with respect to the salinity with reduced inflows with these dry outs?

DR. KRANTZ: There is 500,000 result. By the way, notice that the exposures are primarily around the mouths of the rivers, the New and Alamo River on the south and the Whitewater River on the north.

What this does with reduced inflows and the salinity is the elevation drops drastically, as I mentioned, and the transfer alone would result in a drop of a little over a third of the total depth. The exposures to residents around the Sea would be on the order of a mile to 1.7 miles, if you had a boat on the dock in Salton City. So impacts to recreation are pretty severe.

The exposures down around the Salton Sea National Wild Refuge would be even greater, approximately 3.8 to 5.7 miles.

The impacts on wildlife?

MS. DOUGLAS: Yes. Well, what happens with respect to salinity, first of all?

DR. KRANTZ: That is, in fact, the direct impact on wildlife. And rising salinity goes exponential with the green bar on the graph being the existing slow rate of

salinization, the middle line being the water transfer, the 300,000 acre transfer, this being the worst case, 500,000 acre transfer.

When the salinity reaches 60,000 parts per milligrams per liter, the fishery is expected to collapse. Not all at once, but over a period of several years, which would then lead to bird die-offs and other impacts to wildlife and wildlife resources. Darth Vader of the bird world.

MS. DOUGLAS: How might this affect the regional economy?

DR. KRANTZ: The impacts on agriculture and recreation would be direct and indirect. There is salt and sediment deposits that are exposed around the dry portions of the lakebed that may become airborne and deposited on croplands, reducing their productivity.

The loss of recreational facilities, as I mentioned, at Salton City would be direct and severe. Any recreation oriented facilities would be high and dry. And, finally, the exposure of saline mudflats to the region would represent a huge impact on recreation and tourism.

MS. DOUGLAS: What impacts would the lower sea levels have on air quality?

DR. KRANTZ: The air quality today is extremely arid. It's one of the driest spots in the Western Hemisphere, receives two and a half inches of rainfall a year. So the

ground is usually dry. Prevailing winds would pick up sediments from the lakebed and deposit these on the leeward slopes of the basin.

We know from several meteorological stations in the basin that the prevailing winds are from the northwest. However, during summer months, as here in the Salton City area, we get strong southeasterly winds. So winds from the northwest would pick up sediments from the northwest, deposit those to the southeast. And summer winds would pick up sediments around the Whitewater Delta, depositing those in the Coachella Valley and Palm Springs.

MS. DOUGLAS: How does it affect human health?

DR. KRANTZ: Well, the proof of the air quality problem is that there are already huge sand dunes to the leeward side of Salton Basin. The Algodones Dunes are the largest dune system in the area, in the Western Hemisphere. This creates PM-10, particulate matter less than ten microns, less than ten-billionths of a meter; 200,000 of these could fit into the space of a sugar cube.

These fine particles are lodged in the lungs and are very hard to remove or discharge. Plus you can see Imperial County already leads the state by more than twice the PM-10 of the rest of the counties in the state. These particles at once airborne can travel long distances from Owens Lake, for example, has traveled as far as the Grand Canyon or

Riverside County, virtually bearing down on communities. They contain various cancer causing chemicals in the sediments. From the Owens Lake example, another desert environment, nearly a million tons per year were generated.

MS. DOUGLAS: What about impacts on respiratory ailments, such as asthma?

DR. KRANTZ: This was particularly telling. We looked at the asthma incidents of children in the Imperial County, and found that Imperial is on the extreme upper right of this graph, is more than two and a half times the state average for child hospital discharges of children age zero to 14 at 550 per 100,000, well over two and half times the state average.

MS. DOUGLAS: Just to make sure we are reading that right, Imperial County is the actual very highest?

DR. KRANTZ: It is the very highest bar on the right-hand side.

MS. DOUGLAS: Thank you.

DR. KRANTZ: This is your baseline condition for human health. These are actual hospital discharges. So these are children that have been hospitalized with bronchial problems, exacerbated by PM-10.

MS. DOUGLAS: Finally, how would lower water level affect the prospects of Sea restoration?

DR. KRANTZ: The lower water levels, number one, cause

a rapid increase in salinity, as I mentioned, with these exposures. And as the salinity rises, it is going to be increasingly difficult to exert salinity control mechanisms to contain this.

So, in summary, the good news from all of those studies that we have accumulated over the past four or five years in the database are the Sea is not polluted, as was previously thought, the fishery and bird populations are not ill or crashing. In fact, the bird populations are up dramatically in the past ten years for the fishing eating birds, as is in the fishery.

The agricultural and recreational economies are vigorous, and salinity control has been proven to be feasible at present sea levels. If the water transfers go through, however, they will have these exposures with direct impacts to the fishery, wetlands and birds, the economies of the region, air quality, human health.

And your question regarding the restoration alternatives, the transfers would render salinity control and other restoration alternatives very expensive; they more than triple in cost, going upwards of one and a half billion dollars, if not rendering these mechanisms completely infeasible.

MS. DOUGLAS: Let's talk very briefly about PCL Exhibit 1.

Did you work on that? Can you tell us who produced that?

DR. KRANTZ: We produced this at the database. Much of the Power Point presentation here is built upon this. But this is an impact summary of the proposed transfers. There are copies available for everyone, including late arrivals in the audience. I can make copies available.

MS. DOUGLAS: Great.

Are you -- going back to some of the historical information that you brought up, are you familiar with PCL and Audubon Exhibit 2, which is research by Jerry Schaefer, Archeological Investigations on the Protohistoric Fish Camp?

DR. KRANTZ: Yes. I worked quite a bit with Dr. Schaefer over the past several years, and his compilation of the carbon dates for the tavertene deposits and organic remains and archeological deposits.

MS. DOUGLAS: Are you also familiar with Dr. Philip Wilkes -- oh, no, I am sorry, that is the wrong one.

What about PCL Exhibit 8, the Buckles and Krantz article, Reconstruction of Prehistoric Shorelines? Did you do the work on that?

DR. KRANTZ: We actually completed that work. That was involving GPS location of the Lake Cahuilla shoreline, at very discrete locations, based on geomorphological features and other things. We laid that over our digital elevation

model in our GIS, and we generated those Lake Cahuilla maps based on that.

MS. DOUGLAS: Do you have any concluding statements you would like to make?

DR. KRANTZ: Other than to underscore the fact that regardless of one's view of the water transfer, if it is, in fact, accidental or not, what is really significant here is the tremendous biological and human resources that could be affected by the water transfer.

MS. DOUGLAS: If I could, I would like to change the order of my next witness with Dr. Vogl.

CHAIRMAN BAGGETT: I would like to take a short recess first and then --

MR. OSIAS: Since this wasn't a panel presentation, should we not cross this witness?

CHAIRMAN BAGGETT: I prefer to cross them as a panel. I think that is -- you still have your panel of --

MS. DOUGLAS: I have three, Dr. Hurlbert and Mr. Vogl.

CHAIRMAN BAGGETT: Who do you want to move?

MS. DOUGLAS: I would like to take Mr. Vogl second and Dr. Hurlbert third.

CHAIRMAN BAGGETT: That is fine. Let's take a five-minute recess, then we will cross-examine this panel.

MS. DOUGLAS: If I could make one more -- there were a couple pictures in the Power Point that we just went through

quickly that were not in the booklet. Mostly they're pictures of birds in an animated sequence. If you would like, I could put the Power Point into evidence as well.

CHAIRMAN BAGGETT: I think it would be better --

MR. OSIAS: I have no objection.

CHAIRMAN BAGGETT: -- to put the entire Power Point into evidence.

MS. DOUGLAS: If we can mark that as PCL Exhibit 35. Is it all right with the parties that would rather have paper service, that I give you a CD because you won't -- it will be very difficult to give you copies of it.

MR. OSIAS: For this a CD would be fine.

CHAIRMAN BAGGETT: Let's take that recess.

Thank you.

(Break taken.)

CHAIRMAN BAGGETT: Back on the record with PCL's second witness.

MS. DOUGLAS: Mr. Vogl, do you recognize the document before you, labeled PCL 28?

MR. VOGL: Yes, I do.

MS. DOUGLAS: What is it?

MR. VOGL: My testimony.

MS. DOUGLAS: Is everything in the testimony correct and true to your knowledge?

MR. VOGL: Yes, it is, with the exception that you

referred to me as Doctor. I actually don't have a Ph.D. I have a Master's and Bachelor's of zoology.

MS. DOUGLAS: Sorry about that.

Could you go through some of your qualifications to testify about sediment in the Salton Sea?

MR. VOGL: Yes. I am a principal hydrologist with my own company, Hydrogeo Consultants. I'm a registered geologist in the State of California, Arizona and Oregon. I am also a certified hydrogeologist, certified engineering geologist and registered environmental assessor in the State of California. And I have been practicing in this field for 15 years.

MS. DOUGLAS: Do you recognize the document before you labeled PCL 20?

MR. VOGL: Yes, I do?

MS. DOUGLAS: What is that?

MR. VOGL: It's a report that was written by Levine Fricke for the Salton Sea Authority. It is Environmental Reconnaissance of the Salton Sea: Sediment Contaminants, Riverside and Imperial Counties, California.

MS. DOUGLAS: Did you conduct research for that report personally?

MR. VOGL: Yes, I did.

MS. DOUGLAS: How was the LFR study implemented?

MR. VOGL: It was implemented in two different phases.

The study was actually done in the winter of 1988 [verbatim], 1999. The first phase was done in late December of 1998, and the second phase was done in January of 1999.

MS. DOUGLAS: And how did you go about studying sediment?

MR. VOGL: Basically, there was a number of different samples collected. This is a figure that is actually in the report. It shows where all of the samples were collected. There were sediment grab samples. It is a little bit hard to see, but the ones in yellow, basically, that was just a dredge-type sediment sampler that was dropped off a boat to the bottom, sprung and sediment samples collected and subsamples sent to the laboratory.

CHAIRMAN BAGGETT: Could you identify the figure?

MS. DOUGLAS: Is there a number of the figure or page number?

MR. VOGL: It is actually --

MS. DOUGLAS: Exhibit 20.

MR. VOGL: Exhibit 20, Figure 2.

CHAIRMAN BAGGETT: Thank you.

MS. DOUGLAS: Thank you.

MR. VOGL: So there was -- in the first phase there is 42 grab samples collected throughout the entire Sea and in additionally six core samples. The grab samples were just collected of the upper few inches of sediment. The core

samples were actually driven six feet into the sediment and then subsampled at one-foot intervals. And there was, like I said, six core samplings collected. The cores were actually where the squares are.

The first phase really focused on the tributaries of the Whitewater River, the Alamo River and its deltaic fans, and then the New River. And then a scattering throughout the whole entire Sea.

MS. DOUGLAS: And the second phase?

MR. VOGL: The second phase was an additional 15 grab samples and ten core samples that were collected in areas that high concentration were identified in Phase I, as a follow-up for additional delineation of contaminants in those areas.

MS. DOUGLAS: Could you please describe the composition of the sediment in the Sea?

MR. VOGL: The sediment is composed of sand, silt and clay particles. The sand size particles are fairly fine grain, and the majority of the sediment is actually silt and clay, especially the top foot of sediment that was encountered.

MS. DOUGLAS: What is the significance of whether the sediment is silt, sand or clay?

MR. VOGL: The silt and clay particles are very fine grained and they can become airborne easily and stay

airborne for long periods of time. The sand particles under high velocity wind can actually become airborne, but they fall out of the wind. They drop out a lot quicker.

MS. DOUGLAS: What did you look for in your analysis of sediment samples?

MR. VOGL: We looked at a lot, a number of different chemicals. We looked at metals and metalloids. We use the standard California Code of Regulations, 17 metals that we looked at. We looked at volatile organics, semivolatiles, and then a number of different pesticides, MPCPs.

MS. DOUGLAS: Did you use standard methodology in your field for looking for and analyzing for the -- looking for the chemicals?

MR. VOGL: Yes. All the methods were standard methods for collecting the samples, and great care was taken not to cross-contaminate these samples. In addition, all laboratory work was done by an outside laboratory that was certified by EPA for all the test methods that were performed.

MS. DOUGLAS: How did you determine whether chemicals were present at a level of concern?

MR. VOGL: We compared the values to different comparison numbers. One of them was some baseline values, averages for Western United States. Others were the ERL and

ERM values, which are looking at biological effects.

MS. DOUGLAS: Can you explain a little more about ERL and ERM?

MR. VOGL: ERL values are basically studies that were conducted for individual chemicals of concern. The ERL is 10 percent of a study showed ecological effects, biological effects, and then the ERM is 50 percent of the population showed effects. And these are published by NOAA, National Oceanic and Atmospheric Administration. They are one of the most wildly accepted and used criteria for comparison of sediment.

MS. DOUGLAS: In your opinion, are ERL and ERM values appropriate for evaluating ecological risk at the Salton Sea?

MR. VOGL: That was beyond our study. We were mainly looking at what was out there. We had to just quickly compare it to something. But the data, the conditions that are at the Sea are actually well outside the norm of the population that the ERL and ERM values are used for. And because of the high salinity and other differences in the Sea environment, those values actually may be much lower under the Sea, and so they are not really a great comparison.

MS. DOUGLAS: The values are lower and maybe the risk levels are higher? Is that what you mean?

MR. VOGL: Yes.

MS. DOUGLAS: What inorganic chemicals did you find at levels of concern?

MR. VOGL: We found mainly cadmium, copper, molybdenum, zinc, nickel and selenium.

MS. DOUGLAS: Which was the most elevated?

MR. VOGL: The selenium was one of the highest. It was high for even the background concentrations and typical baseline values. And then they are also very high for what's been found at the Sea. We found a number of high numbers. And, in fact, originally the high selenium numbers that had previously been found were in this general area, right here. For the Alamo River, a previous study was done. And we found the concentration low there, but we found similar high concentrations to that study in the northern part of the Sea.

MS. DOUGLAS: Could you maybe show some of the figures of where the inorganic chemicals are concentrated in the Sea?

If we could identify the number. This is all PCL Exhibit 20.

MR. VOGL: Quickly I will run through the set that I have. This shows the sand distribution. This is actually Figure 3. What it shows is there is higher percentage of sand in this general area, and this is actually the divide

of the Sea where it sort of divides into two separate basins.

MS. DOUGLAS: You're indicating in the middle there?

MR. VOGL: Yes.

MS. DOUGLAS: Just for the record, the pointer doesn't get picked up, so try to describe as you point.

MR. VOGL: In the separate part of the Sea. And also at the Alamo River and New River and their deltas, where the higher velocity inflows come into the Sea, the coarser grained sediments tend to drop out right in those areas.

This is Figure 4, and it shows the silt distribution. And as you can see by the Whitewater River, we have some really high silt percentages. Then also in the southwest portion of the Sea we have very high silt percentages.

This shows the clay distribution. It is as high as in the 50-percent range in the deeper waters in the central part of the southern basin and also in the Southwest. Again, up by Desert Shores there is some high clay areas.

This shows the cadmium distribution with the highest concentration being detected at 5.8 milligrams per kilogram, which is detected up in the northern part of the Sea, up near the Whitewater River.

MS. DOUGLAS: Which figure is this?

MR. VOGL: This is Figure 15.

This shows the distribution of copper. That is Figure

16. And you can see that the highest concentrations are directly related to the inflow of the Whitewater River with a high concentration of 53 milligrams per kilogram.

Here is the molybdenum concentrations. This is Figure 17. You can see the highest concentrations are in this area. And the only real comparison was the baseline values for the Western United States, average values that we compared these to. Pretty much all the concentrations of detected molybdenum were well above anything detected in the Western United States. These concentrations were pretty significant and covered a large area of the Sea.

Here is the nickel distribution, which is Figure 18. Again, you can see some high concentrations up in the Whitewater River area and some other spots down in the deeper parts of the Sea and some more right out in front between Alamo and the New Rivers.

Here is the zinc distribution, which is Figure 19. And again, you can see they're associated with the Whitewater River inflow and then also where the, I think it is, Salt Creek, where it flows in. So this may actually be associated with some naturally occurring sediments in the area and runoff from those.

Here is the selenium distribution, which is Figure 20. And you can see the concentrations, the highest concentration really centered in the northern part of the

Sea. And also the highest concentration of 8.5 milligrams per kilogram. Generally, the concentrations of all those metals and metalloids were higher in the upper one foot of sediment that were analyzed. In the deeper cores they weren't as high.

And because of that upper foot, as I said previously, is very fine grained in nature, and during wind periods on the Sea they can actually become churned up and move around quite a bit in the Sea. So these concentrations could actually be redistributed throughout the entire Sea and change their actual position.

MS. DOUGLAS: From the wind?

MR. VOGL: From wind generating the water and stirring up the stuff off of the bottom.

MS. DOUGLAS: Did you find lead in the sediment?

MR. VOGL: Yeah. Lead was detected, and it was -- I think the highest concentration was 50 milligrams per kilogram.

MS. DOUGLAS: Is that higher than the ERL or ERM?

MR. VOGL: I think it is equal to the ERM value.

MS. DOUGLAS: What about arsenic?

MR. VOGL: Arsenic, although -- it wasn't that elevated compared to the comparison number we were looking at. The arsenic levels that were present did exceed the USEPA Region 9 preliminary remediation goals for both residential and

industrial with a cancer end point. Those values were .039 for residential, milligrams per kilograms, and 2.7 milligrams per kilogram for industrial. Quite a few of the concentrations that were defected exceeded these values.

MS. DOUGLAS: Which volatile organic compounds did you detect?

MR. VOGL: We mainly detected three compounds. And actually out of the 118 samples that were collected and analyzed, 114 came up with positive concentrations for acetone carbon disulfide and 2 butanol. We looked at those VOCs and determined from previous work that was done out here that they may be present as a result of anaerobic degradation of biological material in the sediments, similar to what forms in a landfill under nonoxygenated conditions.

MS. DOUGLAS: Did you find any traces of pesticides in the sediment?

MR. VOGL: No, we didn't. However, we had a slightly elevated detection limit. Because of the matrix interferences with sulfur, most of the sediment had very strong odor, had very high sulphur concentrations. What that does is it causes a major interference when they are analyzing the sample; they have to raise their detection limit. We had slightly elevated detection limits.

MS. DOUGLAS: Have other researchers detected

pesticides in the sediment of the Sea?

MR. VOGL: Yes, they have. There's been a number of over studies performed that show levels that were even in excess of the detection limits that we had, and a number that were below the defection limits that we have in most of our samples. They were still concentrations of ecological significance. They exceed the ERL and ERM values.

MS. DOUGLAS: Do the chemicals that are currently in the sediment impact human health and biota in Salton Sea?

MR. VOGL: There is some limited studies that have shown that they may actually be impacting them, but not to a great degree. One of the things with the sediments that are present right now is they are under water, so they are not that bioavailable.

And when these metals, especially in metalloids precipitate, they're precipitating under anaerobic conditions, without oxygen. And they're becoming -- when they precipitate, they form most insoluble precipitates. And, then, so they are not that bioavailable because they are not dissolved in the water column, and only such pileworms might pick up some concentrations of things that are feeding on them that would get contaminated. But there is no real emergent aquatic vegetation that's picking up concentrations and transmitting them to the waterfowl and

stuff that are used in the area.

MS. DOUGLAS: How could this change if the sediments are exposed from lower Sea levels?

MR. VOGL: I think the main change would be that, one, the sediments would be available in foraged areas where the birds are using the area, and they could potentially pick them up. Also, the biggest change would be the change in the conditions going from anaerobic condition on the bottom of the Sea to an oxidized condition when they are exposed. When that occurs, many of these metals will become resolubilized and then become bioavailable when they are solubilized in that water and can be picked up more readily.

MS. DOUGLAS: Could you explain how that happens? They become solubilized, but do they get back to the water?

MR. VOGL: Yeah. With the runoff going downward into basin, they will eventually end up back in the Salton Trough or in the Salton Sea itself and concentrate even further in that area. But during their transport, when they are in the dissolved phase, any birds or wildlife using that water could actually pick them up in dissolved phase, like the selenium, and could create a lot more problems for them.

MS. DOUGLAS: So you are saying that sediment could go back into the Sea?

MR. VOGL: It will.

MS. DOUGLAS: With contaminants?

MR. VOGL: The metals and metalloids will eventually, through hundreds of years, redissolve and end up in even higher concentrations of reprecipitate in whatever water body in the Sea, assuming there is runoff that occurs over it. That could take a long time, and it also makes it more bioavailable. It opens it up for exposure to much more organisms that are using the area.

MS. DOUGLAS: Would this process also occur with sediments that became airborne and blown to other places?

MR. VOGL: Yeah, definitely would occur with that. All these metals and metalloids and different contaminants that are in here could be directly uptook into the lungs when they are airborne. And then, you know, enter the host and cause all kinds of problems.

MS. DOUGLAS: If water levels drop at the Salton Sea and sediment is exposed, which chemicals that you looked at could have a negative impact on human health or the surrounding ecosystem?

MR. VOGL: All the ones that I mentioned: the cadmium, copper, molybdenum, nickel, zinc and selenium. In addition, the lead and arsenic levels are definitely a concern.

MS. DOUGLAS: Which constituents might cause human health problems if they become airborne?

MR. VOGL: I think all of those could definitely be

problems. The ones that come to mind the most are selenium and arsenic.

MS. DOUGLAS: In terms of human exposure, is there a way that the chemicals would be not only inhaled but ingested?

MR. VOGL: Yes. You know I am not a toxicologist, so I don't really know what the actual health effects would be of those various chemicals. But they not only would be brought directly into the lung with the PM-10 issue, but any particles that did not make it directly into the lung would then been swallowed with mucous and be ingested. So there would be an ingesting component.

MS. DOUGLAS: Are there differences in the effects of chemicals if they are inhaled or ingested?

MR. VOGL: Yes. I think there are different health effects, but, again, I'm not an expert in that area. For instance, hexavalent chromium is a huge issue right now. It is not known whether in water if low concentrations of chromium are ingested, if it creates a huge health issue. But it is well demonstrated that if a particle of hexavalent chromium impacts a lung tissue, that it will result in cancer known as a carcinogen.

MS. DOUGLAS: Finally, is there a possibility that with the arsenic levels that you found in the Sea that there could be violations of ambient air quality standards for

arsenic?

MR. VOGL: Yes. I did a quick calculation and looked at basically the PM-10 standard of 150 micrograms per cubic meter, which according to testimony I've seen, looks like Imperial County exceeds those on a number of different events and would be expected to exceed it on a regular basis.

With those levels of PM-10 in the air, the arsenic levels would be approximately .001 micrograms per cubic meter. The current standard or PRG for Region 9 for arsenic in ambient air is much lower at .00045. So that is exceeded on a regular basis.

MS. DOUGLAS: Thank you.

I have no further questions for this witness. If I could call my third.

CHAIRMAN BAGGETT: Please.

MS. DOUGLAS: Dr. Hurlbert.

MR. OSIAS: Mr. Chairman, I think the schedule that had been sent had suggested that Dr. Hurlbert would be on two panels.

MS. DOUGLAS: He is a witness for Defenders of Wildlife and PCL.

MR. OSIAS: We should cross twice?

MS. DOUGLAS: You will have the opportunity to cross twice.

MR. OSIAS: Or should we wait for at least the end of the second testimony?

CHAIRMAN BAGGETT: Is he testifying to different --

MS. DOUGLAS: He is testifying to different issues. For me he testifies about the current ecosystem.

MR. OSIAS: I have read the testimony. One sets up the other.

MR. FLETCHER: Would it assist --

MR. OSIAS: I was just thinking that I would do it one time?

MS. DOUGLAS: If you would prefer to do it one time.

MR. OSIAS: Let them get both statements out first.

CHAIRMAN BAGGETT: My preference, why don't we go through PCL's --

MS. DOUGLAS: Would you prefer to do cross of these two witnesses and then we can do PCL?

CHAIRMAN BAGGETT: Then we can follow with Mr. Fletcher doing his cross, and then we will do all three of them as one panel.

MR. FLETCHER: I just need a couple of extra minutes to go through my questions.

CHAIRMAN BAGGETT: That is what I am suggesting, whichever order you want to do it in, we will just make it one continuous --

MR. OSIAS: But let Dr. Hurlbert finish.

CHAIRMAN BAGGETT: Correct.

Thank you.

We're off the record.

(Oath administered by Chairman Baggett.)

MS. DOUGLAS: Dr. Hurlbert, can you go through briefly your qualifications to testify on the ecology of the Salton Sea?

DR. HURLBERT: I'm professor of biology and Director of the Center for Inland Waters at San Diego State University. I have studied salt lakes for about 30 years. I've been teaching a course on the Salton Sea and the Colorado Delta for about 24 years, and I have been leading a research group for 12 years on the Salton Sea ecology.

MS. DOUGLAS: Do you recognize the document before you labeled PCL 24?

DR. HURLBERT: Yes.

MS. DOUGLAS: What is it?

DR. HURLBERT: My testimony.

MS. DOUGLAS: Is everything in your testimony true and correct to the best of your knowledge?

DR. HURLBERT: Yes.

MS. DOUGLAS: Can you explain briefly what the current state of knowledge about the Salton Sea is?

DR. HURLBERT: The Salton Sea is a lake that was studied in some detail in the 1950s, essentially no

biological studies thereafter for a number of decades. And then with the funding of the Salton Sea Authority in the last few years, we've seen probably a tenfold increase in our knowledge of the Salton Sea. It is a very large, complex lake. It's unique in many of its characteristics, and most of what we know now is still in press or in preparation.

MS. DOUGLAS: What would you say are the six defining features of the Salton Sea ecosystem?

DR. HURLBERT: These are features that have a major impact on how the system functions, and those functions, basically, determine its value to people and wildlife. And to some extent this repeats information Tim's given you.

It is an extremely large lake, especially in relation to the surface area. It has no outflow and, as is true of other lakes without outflows, that makes it a salt lake. It is fed almost entirely by agriculture and to some extent municipal wastewaters which are high in salt nutrients and certain other contaminants.

It is in a very hot climate, so it has a high evaporation rate. Normally you don't find lakes of this sort in climates of this sort, unless they have a source of water in some distant location. It abounds in fish, which is one of its most important features. And these fish are a result of stocking by Cal Fish and Game that began in the

late 1920s, continued to the early '50s. And then one of the fish got in in the 1960s, the tilapia.

And it formed most recently in 1905, at about the same time that we were beginning the large scale destruction of other shallow lakes and wetlands throughout California. So it's sort of an accidental mitigation project in that sense, and that increases its current value.

And sort of in summary, looking at it in the broadest perspective, a phrase I used in an essay I wrote a few years ago about it is that I called this a tremendously positive symbiosis between agriculture, wildlife and human recreation. It seems to me that the objective of all of us is to try to continue this symbiosis one way or another.

MS. DOUGLAS: Let's move to the food web in the Salton Sea. Can you describe the food web? That is number two, second slide in PCL Exhibit 25.

DR. KRANTZ: These are all I can read, are exhibit numbers. It is not in the Power Point.

MS. DOUGLAS: Can we stop the clock for technical difficulties?

CHAIRMAN BAGGETT: We are off the record.

(Discussion held off the record.)

CHAIRMAN BAGGETT: We are back on the record.

MS. DOUGLAS: If you could please describe the Salton Sea food web.

DR. HURLBERT: This is a simplified representation of it. Because we now know as a result of research done the last few years that the number of species known to be in the Sea has gone from something like 70 to something more than 400. And I'm assured that most of you are not interested in seeing 400 boxes. Some of these boxes actually have a hundred different species in them.

At the base of the food web there are the algae down at the bottom there. It is the photosynthesis of those algae that provides the food resources for nutrients for the entire rest of the food web. Those in turn are fed upon by other organisms, ciliates and amoebas, protozoans. And then a small number of species of insects, crustaceans and worms, including the barnacles, polychaeta, which is the pileworm, copepod, little critter in the plankton, anthropods, little crustaceans that scutter around the bottom.

The algae, of course, are benefiting from the gift of nutrients from agriculture, and the tremendous abundance of algae often cause this lake to be supersaturated with oxygen during the day. At night or deeper in the water column, however, the oxygen consumption by all these organisms often lead to conditions of no oxygen and high sulfides, both of which are deleterious to organisms.

The dominant fish in the Sea are shown there. There are actually a few more species in the Sea, but we've got

three marine species, the bairdiella, the sargo and the corvina. Corvina is the big one. They are catching 13 to 18 pounders out there the last couple of weeks, I guess. And over there on the left tilapia. This African fish that got in the 1960s and exploded to become, at least for a period of time, the most abundant fish in the Sea.

And then a number of fishing eating birds: pelicans, cormorants, herons or various sorts, and other fish eaters like fisherman feeding off the fish. This is a unique and extremely attractive sport fishery primarily because -- at present because of the tilapia and the corvina. The corvina, of course, there aren't too many places anywhere in the country where you can go and catch a limit of five 13- to 18- pound game fish. The Salton Sea is one of the few places where you can do that.

And the tilapia, which also grow to a large size, two to three pounds, with no limit are a great boom to fishermen who like easy food and a lot of people of modest income who go there and catch them.

Next.

MS. DOUGLAS: This was the second image in PCL 25. If we can go to the third.

Could you please tell us about some of the microorganisms in the Sea?

DR. HURLBERT: This next one shows some algae. They

are called dinoflagellates. These are dinoflagellates, a type of algae, very common in coastal regions throughout the world. These are -- you've heard of red tides, and these are one of the major causes of red tides in coastal oceans. The Salton Sea, they are why the lake often looks like a cup of black coffee this time of the year, in the winter. They become extremely abundant. Important base of the food chain.

These are some of the smaller animals that live on the plankton of the lake. Up on the top there on the left are a couple rotifers. On the right top are the larvae of this worm, the annals of which live in the sediments and get up to be a couple of inches long. Down at the bottom left there is a copepod, predaceous, and also feeds on algae. And then the larvae of the barnacles that grow on every hard surface on the Sea, and the fish egg. These are all critters that are mostly less than a millimeter long. And the adults of some of those live on the bottom and are much larger.

MS. DOUGLAS: Are there microorganisms in the Sea that aren't found anywhere else?

DR. HURLBERT: The research that has been done by people working with our group over the last couple years have brought in taxonomists, systemists, from various other institutions across the country and to some extent other

countries. And they have found large numbers of species that are completely new to science here, including some genera. Although there are relatively few species of fish and few species of the big invertebrates, this is one of the most diverse microbial assemblages that we know of in the country.

MS. DOUGLAS: Would you describe the Salton Sea as a rich ecosystem?

DR. HURLBERT: The Salton Sea is an extremely rich ecosystem. Part of the problem it has is that the high nutrient input makes -- creates this richness, creates tremendous food supplies for anything that can take the conditions here. On the other hand, all of this abundant life eventually dies. It respires, uses up oxygen while it is alive. When it dies it decomposes, and decomposition uses up oxygen. As is typical of all sorts of lakes or aquatic systems, you have high richness. You have high water quality problems.

MS. DOUGLAS: Do you have -- can you talk about pileworm and maybe you have and an image of the pileworm?

DR. HURLBERT: I don't have. I showed you one of the little critters, looked like a little spider. It was the larvae of the pileworm. And they are very abundant in the water column, an important food for fish, as are the bigger adults that occur on the sediments.

It is because there are few species of these larger invertebrates in the lake that the pileworm has tremendous importance for that reason.

MS. DOUGLAS: What are some of the reasons for fish kills in the Salton Sea?

DR. HURLBERT: The fish kills are -- I preface these comments by saying that there have been almost no studies of these kills themselves. So our information is based on observations made incidental to studies of other things. But we know that the bottom of the lake becomes inoxic at certain times of the year, and you get a buildup of sulfides in those bottom waters. Then you can have the lake turn over at certain times, especially in the summer, early fall, and the lack of oxygen and high sulfide levels that develop from the bottom of the lake to the very surface waters for brief periods of time are one of the major causes of kills in the summer.

And for the tilapia, the tilapia are a tropical fish from Africa, and they are at just about their lower temperature tolerance limit in the wintertime in the Sea. Some if you have a winter that is a little colder than usual, that could be a major cause of kills of those tilapia.

I think the next -- this relates to the richness of the Sea. This graph shows on two axes, two of the major factors

that determine how rich or how productive any water body is. And on the vertical axis there, you've got the rate at which nutrients are coming into the water body. In this particular case, the units are phosphorous coming in. And on the horizontal axis you have the depth of the lake. The shallower lake is the more rapidly you can cycle nutrients from the water column to the bottom back to the water column. Those two factors tend to favor high richness.

The red portions there show the Salton Sea. The lower red dot is where it was in 1968. Over the last 30 years the input of nutrients in the Sea has more than doubled, probably primarily as a consequence of increased population in Mexicali. So that is phosphorous from municipal wastewaters in Mexico. And the arrow going off to the upper left there is the direction we are headed if we have continued increased inputs of phosphorous, again possibly from Mexicali, not from agriculture, and the shallowing of the Sea.

So we go to that higher -- in the upper left-hand corner we have very poor water quality, but very high productivity.

MS. DOUGLAS: If you were to compare life in the Sea and products of the Sea with Lake Tahoe, for example, what would you have to say about that?

DR. HURLBERT: Actually, I was just talking yesterday

with Charles Goldman, who is head of the Tahoe Research Group, and I suggested we would be willing to take some of the freshwater in Lake Tahoe if he'd accept some of nutrients from the Salton Sea. He didn't agree to that.

Tahoe is a beautiful lake, but basically a biological desert. It is a slight exaggeration, but I've often said that we've got more life in one cubic meter of Salton Sea water than we have in the entirety of Lake Tahoe. Lake Tahoe is down on the lower right-hand corner of that figure there. So it is beautiful to look at. If you're interested in being able to see the bottom through 30 meters of water, that is the place to go. If you want to fish, you go to the Salton Sea.

MS. DOUGLAS: What are some of the critical ecological processes and phenomenon of the Sea?

DR. HURLBERT: This eutrophication that is illustrated here, nutrient inputs and the effect that has on the system is one of the major ones. The increasing salinity of the Sea is another process, of course, that we are highly focused on in these hearings. Within the Sea, understanding how the Sea functions on a seasonal basis, that is to a large extent driven by temperature and wind and their changes seasonally.

Next.

This shows how the temperature changes during the

roughly two-thirds, three-fourths of a year when the Sea is warming up. Over there on the left-hand side you've got purple temperature profile. In the winter the temperature tends to be about the same from top to bottom. And as the lake warm up, you get warming of surface waters, and that makes it less dense than bottom waters and makes it difficult for them to mix, top of the lake mix top to bottom. But then you will have a wind event every so many days or so many weeks, and it will mix the lake, create temporarily isothermal conditions.

So you have a whole temperature curve shifting over there. That last one there is for September, early September, which was when we had the maximum water temperatures. That is over 90 degrees Fahrenheit there, mean water temperature. Great for swimming that time of year. And these temperature curves and particularly the stratification, evident from the fact that the curves are not vertical, but they are sloped, that stratification is what impedes the delivery of oxygen to bottom waters.

So the next slide which shows the oxygen profiles for the same period of time, but now we are starting over in the right-hand side with a curve for January there, showing good oxygen levels from top to bottom. In fact, the surface waters are supersaturated with oxygen at that time because of the dense algal blooms in the surface waters.

As the lake warms up, partly because oxygen is less soluble in warm waters and partly because you have higher rates of respiration and decomposition by the biological community, you get the curves in the summer where there is often no or next to no oxygen in the bottom waters and even in the surface waters there is going to be very low levels.

MS. DOUGLAS: What is the significance of some of these events? What does that do in the Sea?

DR. HURLBERT: If you have a situation that is shown in the last temperature profile there, and you would have no oxygen in the bottom waters, you would have had a buildup of hydrogen sulfide in the bottom waters. And the next time a wind comes along, that is where it creates conditions favorable to these kills, not only of the fish, but it kills off the invertebrate populations in the affected areas. It even kills off a lot of the algae although they can come back pretty quickly.

MS. DOUGLAS: With that I will turn the witness over to the Defenders of Wildlife.

CHAIRMAN BAGGETT: Thank you.

MR. FLETCHER: Good morning, Dr. Hurlbert.

DR. HURLBERT: Good morning.

MR. FLETCHER: I think we have already gone over your qualifications. But could I have you turn to Defenders of Wildlife Exhibit No. 2. You should have it in front of you

in that binder.

Can you tell me what that is?

DR. HURLBERT: That is my testimony.

MR. FLETCHER: Your written testimony for Defenders of Wildlife?

DR. HURLBERT: Yes.

MR. FLETCHER: Are there any corrections or clarifications you would like to make to that testimony at this time?

DR. HURLBERT: No.

MR. FLETCHER: Can I just suggest one?

DR. HURLBERT: Sure.

MR. FLETCHER: It is actually a clarification rather than correction. But on Page 2 right at the top there, there is a bracket and some boldface typing there on the right margin. It seems to say mono proton-south. There is a similar one on the next page.

Do you see where I am referring?

DR. HURLBERT: Yeah.

MR. FLETCHER: Can you tell me what those indicate?

DR. HURLBERT: Those indicate slides that are in this presentation.

MR. FLETCHER: That was the case in Planning and Conservation League testimony as well?

DR. HURLBERT: Yes.

MR. FLETCHER: I would like to ask you a couple questions about your testimony.

How would the Salton Sea ecosystem and its food web be affected by an increase in salinity?

DR. HURLBERT: That is a very easy question to answer in a broad way and a very difficult one to answer with sort of precision. We ideally like to talk about what is going to happen over the next decade or two.

As you go to higher salinities, although right now this lake has one of the most diverse biotas of any lake we know of, very quickly, as we go to higher salinities, we are going to reach a point where various species reach their salinity tolerance and some day become extinct in the Sea. The fish are among the first organisms that is likely to happen to. Of course, when we lose the fish, we lose the Sea as a resource for fish eating bird. We lose one of its major recreational values. And then, as it the salinities go higher and higher, eventually you eliminate many of the larger invertebrates and new ones take their place, like brine shrimp and brine flies.

MR. FLETCHER: How would you describe the analysis of those impacts, those salinity impacts, as described in the EIR?

DR. HURLBERT: When I read that, I said, "I've seen this somewhere before." For many years I was a consultant

to L.A. Water and Power on Mono Lake research programs. And I prepared a paper after many years of doing that when the National Academy of Sciences and another group put out sort of a summary of what was happening at Mono Lake.

They are trying to address the same general sort of issues we are trying to address here. What are going to be the consequences of the salinity at Mono Lake was allowed to continue increasing.

And the main criticism I had of the summaries was that they were trying to find magic numbers, critical values, that particular species would be negatively affected, and you can't do that. I can understand how you would like to have those as decision-making tools, but that is simply not the way natural systems work when you talk about gradually increasing levels of some variable.

I think the next slide shows a figure from that critique I wrote of these Mono Lake reports. And the top figure there reflects the language that was used in those reports. It talked about things being fine up until you reach some magical or critical threshold for a particular species. Very soon after that it's disaster for that particular species, at least.

What biologists know is reflected in the bottom figure. We know that if we are talking about something like the production of organisms in the lake, and production is

what we are really interested in, it is the amount of fish production that ultimately is of interest to the fishermen. How many pounds are generated per acre, per year? It is that same production that is of interest to fish eating birds. What is the rate of fish being produced?

That is a function of a number of things: of reproductive rate, of survival of the juveniles, of growth rate of the fish that do survive. And each one of those functions might have some particular psychological optimum. But what we know is that for all the fish populations in the Sea, we are not at the hump there. We are not at the optimal salinity for any of these variables.

These fish have all been under stress for some time in the Sea. Now whether -- so we are on the downslope side of those curves. Whether we are 20 percent below the hump or 90 percent, we don't know. We don't have that data for any of those species. That sort of the -- that is a model that we should use in thinking about this. Ideally if we had an option, we wouldn't be talking about where does that curve hit the baseline, how far on the right-hand side. That point is not of any interest, either to pelicans or to fishermen because they're going to have left the Sea decades before you hit that point where the thing goes extinct.

What we should be focusing on is, if we are going to manage this lake, how do we get the Sea back so it sort of

corresponds to the hump point for most of the fish there.

MR. FLETCHER: Actually, I would like to -- I am glad you brought that up because, obviously, this is at some level a practicalist proceeding, and they're decisions that need to be made. So in terms of decision maker's point of view, when you look at these curves, do they -- does the model that you criticize as compared to the models you've described there, does the focus on critical threshold overstate or understate the impacts of an increase on salinity -- of salinity?

DR. HURLBERT: I think I would have to say it basically misstates it. It gives you the idea that can be adopted very quickly that, gee, we don't have to worry about anything unless we get to 50 or 60 or some particular magic number. I think that is what I would say on that.

MR. FLETCHER: In the space of time before we get to the magic number what is going on?

DR. HURLBERT: The best way to -- because these fish are all on the downslope side, we know sort of basic principles of what we know about the biology of these particular species. So any -- as soon as the rate of salinity increases, is accelerated by anything, you have a negative impact. I think the key number here is -- it is the difference in the rate of salinity increase under, say, constant lake level conditions, constant inflow conditions

versus a project where you would drastically lower the level of the Sea and lower inflows.

As I understand the current models, the rate or the salinity increase would be accelerated by a factor of roughly threefold. And that is the real measure of the magnitude of the project.

MR. FLETCHER: From a management perspective, what are the management implications of the relationship between salinity and productivity?

DR. HURLBERT: The management implications would be that you want to reduce salinity levels back down towards something closer to 35, 40 parts per thousand.

MR. FLETCHER: In relation to actions that could increase salinity levels, what would the implications be?

DR. HURLBERT: When you get to higher salinity levels, there has been a number of places where the idea has been put forward, and it is present in the Draft Environmental Impact Report, that if you get highly saline conditions as you would have after the fish disappear, you get this tremendous burst of productivity of other organisms, mainly different types of insects and crustaceans that are great food supplies, maybe not for fish eating birds, but other types of birds, and you could actually go in that direction if you wanted to manage for those types of bird. But the salinity increases also cause a reduction over time of the

productivity of those invertebrates.

So the literature sort of based on the Draft Environment Impact Report greatly exaggerates how valuable these highly saline systems without fish would be to any birds.

MR. FLETCHER: In this phase at least, maybe also in Phase I, I know people have testified that Mono Lake and the Great Salt Lake have been held up as examples of kinds of ecosystems the Salton Sea could become if it did become even more hypersaline.

Are those reasonable comparisons?

DR. HURLBERT: There is a tendency on the part of people who haven't any direct knowledge of salt lake ecology to think of them as sort of different than freshwater lakes. Nobody would think of saying, well, Tahoe and Clear Lake should be similar systems because they are both freshwater.

On the other hand, people tend to think, well, if you've got highly saline lakes, they should be similar because they are highly saline.

Using Mono Lake as a model for what might happen to the Salton Sea would be very unwarranted from a number of points of view. I think the next slide shows --

MR. ROSSMANN: How about Defenders' 5? That's where I'm finding this stuff.

MR. FLETCHER: We are actually looking at this slide, and there is a -- in Defenders' 5 there are predictions.

Can you just describe orally rather than our taking a lot of time to find that?

DR. HURLBERT: Sure. Mono Lake is very different physically, chemically, in terms of the size and shape of the basin, in terms of what is in it. Mono Lake would be a much more benign environment than would the Salton Sea for these invertebrates that are supposed to become very abundant if we reduce the level of -- increase the level of Salton Sea.

In particular the Salton Sea, I showed you a picture of a little thing called a copepod there, which is only about a millimeter long. That is a very good predator, Artemia. We have done experiments showing that that can eat the baby larvae of Artemia. Until the copepod disappears from the Sea, Artemia would not become abundant. That copepod has extremely high salinity tolerance. It can reproduce at least as high as 68 grams per liter.

So Mono Lake doesn't have a copepod like that, and as the salinity drops in Mono Lake a little bit more, it's not going to have a predator like that come in and decimate the brine shrimp populations there. And the brine flies, these are flies you see in large numbers, the adults along shorelines and the larvae live on the bottom sediments of

the lake. They become very abundant in salt lakes without fish. But they are very dependent on having a good food supply that is algae that grow on the surface of the mud or the, sediments, and they are very dependent on having good oxygen conditions deep in the lake.

Mono Lake is a much cooler lake, averages about ten degrees cooler, so it doesn't have the heat stress. That means it can hold more oxygen, other things being equal. The water's much clearer, so light penetrates deeper. You've got algae growing on the sediment surface to much greater depths than you do in the Salton Sea. In Salton Sea in the summertime you have consistent good oxygen conditions only down to maybe three to four meters. Whereas at Mono Lake you have got oxygen condition down to 14 to 18 meters.

They really are -- the difference between those two systems is as big as the difference between Clear Lake and Tahoe in many ways.

MR. FLETCHER: I would like to move on from salinity now and talk a little bit about the Habitat Conservation Plan that is in the Draft EIR.

DR. HURLBERT: I have a copy in the back of the room.

MR. FLETCHER: We may not need it.

Have you reviewed that HCP? Are you familiar with the fish pond proposal which is HCP1?

DR. HURLBERT: Yes.

MR. FLETCHER: You worked on a study and proposal submitted to Salton Sea Authority by Pacific Institute; is that correct?

DR. HURLBERT: Yes. I was asked by the Salton Sea Science Office to prepare the summary evaluation of the workshops involving about 30 scientists and engineers who took a close look at that proposal.

MR. FLETCHER: The result of that process is the report that is Salton Sea Exhibit No. 12; is that right?

MR. OSIAS: Mr. Chairman, if I might, we have now, I think, had in one testimony the written testimony and summary for both submissions by Dr. Hurlbert. There has been no written testimony submitted and, hence, I am not understanding how he could summarize it with respect to his review of the HCP, the subject area we are now going into, nor have there been any cross-examinations about that for which he would do redirect.

I object to this. We didn't get notice that this witness was going to comment on the HCP.

CHAIRMAN BAGGETT: Response.

MR. FLETCHER: My understanding was that witnesses could respond or testify as to matters within their competence.

CHAIRMAN BAGGETT: Only if you presubmitted it.

MR. KIRK: Mr. Chairman, Salton Sea Authority Exhibit

No. 12, the aforementioned document, was, in fact, prepared by Stuart Hurlbert. In deference to doing this timely, I didn't include Stuart Hurlbert on my witness list because of the fact he was part of the Defenders and PCL.

MR. OSIAS: The disadvantage I am faced with is someone faced with his cross-examination, period. No one gave us warning that this arrangement had been worked out yesterday with the Salton Sea Authority. I prepared for those witnesses today as Defenders of Wildlife. I've read their testimony. I am prepared to talk about that in cross. But this subject area --

CHAIRMAN BAGGETT: I think --

MR. ROSSMANN: Perhaps, your Honor, there might be a middle way out. I have a feeling we are dealing with folks -- we know how hard it was to get the folks here on their schedule. And perhaps -- we had this problem earlier in the proceeding. Just by having the cross-examination come after lunch, that might give Mr. Osias the opportunity so that Mr. Fletcher doesn't have to bring him back as a rebuttal witness. Trying to be sensitive to these folks' schedule.

MR. OSIAS: I appreciate the confidence you have in my hour of time, but I'd actually --

MR. ROSSMANN: It is higher than that.

MR. OSIAS: He's a very qualified scientist. If we got his testimony in advance, I'd consult with somebody to

prepare whether I have cross or not. That is why we get them in advance. I don't think hearing it orally and using the hour that we might have at lunch to do that. I would like to see his testimony, and at some point it could come in. I want to read it ahead of time so that I can prepare for cross rather than --

CHAIRMAN BAGGETT: That is legitimate. I would sustain the objection.

How do we get to a practical solution?

MR. OSIAS: Apparently Mr. Fletcher knows something about what Dr. Hurlbert is going to say on the subject of the HCP. I suggest he have him write it down, circulate it and then have to come back if we have any cross.

CHAIRMAN BAGGETT: He could come back. Clearly could be used as a rebuttal witness. He could come back. Since I asked for presubmission of witnesses and testimony on rebuttal, that is a chance to clarify it. I think you need to wait until then. The fact that it is an exhibit doesn't mean it is testimony. The report is an exhibit. It is not the same as having testimony on that report.

MR. FLETCHER: I appreciate that.

MR. ROSSMANN: Thank you, sir.

MR. FLETCHER: I have no more questions.

CHAIRMAN BAGGETT: Let's take a five-minute break, come back and try to get some of the cross done before we go

for lunch.

(Break taken.)

THE COURT: Back on the record.

Mr. Gilbert, do you have any questions?

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY MR. GILBERT

MR. GILBERT: Thank you, Mr. Chairman. Just a short one, and I'm not sure who it is for.

But in regards to the fishery of the Salton Sea and the amount of fish that are available there, does anyone have any numbers of how many fish are taken by anglers, how many are caught and eaten by people?

DR. HURLBERT: I don't think there have been any estimate of that sort I gather in recent years. Cal Fish and Game may be planning to get that information. They have an expanded crew out there, I understand.

So all we know is what we hear from the various people on E-mail, they're biting today on the green wiggly things.

CHAIRMAN BAGGETT: Will be the next panel.

DR. KRANTZ: The most recent numbers I have seen for actual catch rates were produced by the Department of Fish and Game for the late '80s, I believe, and I can't remember what the catch rates were, but they were by far the highest in the state.

MR. GILBERT: Per person?

DR. KRANTZ: Based on per person per hour.

MR. GILBERT: Is there a lot of people fishing there all the time? Are the boats out there very sparse?

DR. KRANTZ: Combination of boats and -- it is shallow enough that a lot of people wade out in hip highs, and a lot of shore fishermen, but I don't have actual numbers for that.

MR. GILBERT: Thank you.

That is all.

CHAIRMAN BAGGETT: Mr. Du Bois.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY MR. DU BOIS

MR. DU BOIS: I just have one question. I don't know who to ask it of. I know that some of the fish are caught by anglers, and I presume most of them are caught by birds, and some of them die on the shore because I've seen that.

What happens to the rest of them?

DR. HURLBERT: They are just waiting.

MR. DU BOIS: Do they ever die? What happens to those that die in the Sea?

DR. HURLBERT: The birds probably take a very small percentage of the fish. Birds can't fish out of a lake that is deep, and fishermen can't either. So most of these --

some of the fish die when they are a day old, and some die when they are a week, and some a month and some live for several years. So the concept of natural mortality going on as bigger some years than others, but it's just a concept of recycling, basically.

MR. DU BOIS: What happens to the flesh? There aren't any lobsters or bottom feeders, are there or are there in the Sea to eat the detritus?

DR. HURLBERT: Some of the invertebrates might scavenge on dead fish a bit, but mostly the fish would be broken down by bacteria. The bodies would be completely decomposed with the exception of the bones, perhaps, and converted back into nutrients that go into solution in the water, feed the algae.

MR. DU BOIS: Thank you.

CHAIRMAN BAGGETT: Thank you.

Mr. Rodegerdts.

MR. RODEGERDTS: Nothing.

CHAIRMAN BAGGETT: Mr. Rossmann.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY COUNTY OF IMPERIAL

BY MR. ROSSMANN

MR. ROSSMANN: Good morning, gentlemen.

I haven't had the pleasure of meeting most of you. I

am Mr. Rossmann. I represent Imperial County. Thank you very much for taking the time to be with us today.

Let me ask each of you to respond to this question.

Do you believe the Salton Sea is a resource of national significance?

DR. KRANTZ: Most certainly.

DR. HURLBERT: Yes.

MR. VOGL: Yes, sir.

MR. ROSSMANN: Would each of you please give your reasons for that answer?

DR. KRANTZ: It exceeds almost anywhere else in the United States in its diversity for birds. Also, as we have seen with the bird banding study, it is actually more than a national resource. It is very much an international resource of great significance continentwide for many species, not just pelicans and grebes. It represents a very significant resource for the birds throughout the migratory path.

The significance there, I think, is that we have lost more than 90 percent of the other wetlands in California, the Central Valley, that used to harbor these birds, and this has become virtually their last refuge for many species.

MR. ROSSMANN: Let me ask you on that, sir, before I ask Dr. Hurlbert to answer the question about the basis,

when you say international, do you believe that there are any migratory bird treaty implications from the potential loss of wildlife at the Salton Sea?

DR. KRANTZ: Quite possibly, yes.

MR. ROSSMANN: Do you have any further elucidation or basis for that?

DR. KRANTZ: I have not seen that invoked, but quite conceivably, for example, in the case of the snow geese and Ross' geese, this is very significant wintering ground for those species that are Canadian species. In large part that is why they breed.

MR. ROSSMANN: Dr. Hurlbert, to you, sir, the explanation for your belief on national significance.

DR. HURLBERT: I'd second what Tim said about its importance to birds and thereby its importance as one of the major bird watching -- it's one of the most popular bird watching spots on the continent. You have a lot of people coming, especially in the winter for some reason, to bird watch there.

It's also as a large lake, which is a great place to swim in and fish and boat and do other things. As the largest lake in our region where you have population growing at a very high, rapid rate in Southern California in general, it's an accessible recreational area that is as important as some of our national parks.

MR. ROSSMANN: Thank you.

Mr. Vogl.

MR. VOGL: I would agree on the issue with birds, that it is very significant, especially with the fact that white pelican and the eared grebe, that a huge percentage of the Pacific Flyway population ends up wintering there. And definitely spans across international borders as far as the bird migration with snow geese and other species.

MR. ROSSMANN: Thank you.

Let me ask each of you, implicit in your answer, would you agree with this statement, that the Sea is also a stabilizing significance?

DR. KRANTZ: Yes.

DR. HURLBERT: Yes.

MR. VOGL: Yes.

MR. ROSSMANN: Let me start specifically with Mr. Krantz, and I am looking here at PCL Exhibit 1, the very handsome brochure you all have prepared. I just would like to ask a few questions about some of the figures here. And I want to start on Page 4, the periodicity graph, and my question is this:

Am I interpreting that graph correctly, that the Salton Sea did not exist as a body of water between roughly 1800 and 1900?

DR. KRANTZ: That is incorrect.

MR. ROSSMANN: Would you explain the basis or my incorrect understanding?

DR. KRANTZ: A number of different times in that period there were partial inundations that would not be reflected in the scale of the depth axis, which is the Y axis of that graph. So you can see that the depth is indicated there. And so the partial inundations of the Sea were recorded by surveyors and some of those inundations lasted as long as three to five years.

MR. ROSSMANN: Let me look at your testimony. I want to focus in particular, sir, on Page 3 of your testimony, which is PCL Exhibit 22.

DR. KRANTZ: Yes, sir.

MR. ROSSMANN: I'm referring to the description of a flood that is described in 1849.

DR. KRANTZ: That's right.

MR. ROSSMANN: Based on your knowledge and expertise, is it your view that the 1849 flood formed the New River?

DR. KRANTZ: It was in that surveyor's account that, yes, this may have caused the formation of part of the New River Canyon, the channel that later would capture the historic flood.

MR. ROSSMANN: In your opinion, did that flood also result in the inundation of the Salton Sea?

DR. KRANTZ: Yes, it did. It resulted in a partial

inundation. It is described in that testimony as persisting for some years. The surveyor then -- this was looking across the transcontinental railroad route. The surveyor came back three years later and described how the pools were still present and they were of great benefit to the immigrants that were crossing through the desert. They were still using the pools in the New River Channel from that 1949 flood in the year 1952 or '53.

MR. ROSSMANN: What would be the area approximately of those pools?

DR. KRANTZ: It wasn't given.

MR. ROSSMANN: Would it be at all on the scale of the Sea at its present size?

DR. KRANTZ: Probably not.

MR. ROSSMANN: The word "lagoons" is used there. Might it just be a periodic -- excuse me, not periodic, but just a series of isolated pools that may be as large as this room or as long as this building?

DR. KRANTZ: I have no idea.

MR. ROSSMANN: Sir, let me -- I don't know if you have this in front of you. This is Salton Sea Exhibit 16 and this is Sea Notes dated August 2001. It cites Dr. Schaefer's studies, and it says -- I will put this in front of you. As I read this exhibit it implies that the lake as a lake was not filled after 1700.

First of all, let me ask you if you are familiar with that publication?

DR. KRANTZ: I have seen this publication, yes.

MR. ROSSMANN: You have seen that particular issue?

DR. KRANTZ: Yes.

MR. OSIAS: There is --

MR. ROSSMANN: August 2001.

MR. OSIAS: Thank you.

Because there are multiple.

MR. ROSSMANN: Yes. I appreciate that.

Would you please check and make sure I have correctly cited August 2001? I thought that is what I said.

DR. KRANTZ: Yes.

MR. ROSSMANN: The inference I draw from Salton Sea Exhibit 16 is that the lake was not filled as a lake since 1700. If I am incorrect in that assumption, I'd appreciate some enlightenment.

DR. KRANTZ: Well, this is based on Dr. Schaefer's consultation with the Authority when they produced this brochure. I think the idea was simply to convey the sense that there is this periodic inundation of the basin and then drying out of the basin. I don't actually see the years on here.

MR. ROSSMANN: Does that publication list the flood years in the 19th century and expressly exclude or not

expressly exclude but exclude the year 1849?

DR. KRANTZ: It has a listing of years on the back. They are in the 1800s. And they have apparently missed the citation of the USGS survey, 1849. They have included 1853 which was the year it was actually published. That is the report was published then, but the surveyor was in the field and observed the flood in 1849.

MR. ROSSMANN: Let me have that one back.

I see that my colleague, Mr. Osias, may not be finding his copy.

MR. OSIAS: I do have it.

Thank you.

I even made notes on it.

MR. ROSSMANN: Let's continue, sir, back on PCL Exhibit 1. I'm just going to go forward. I am looking on Page 7, and I just see a photograph at the bottom of Page 7 --

DR. KRANTZ: Yes, sir.

MR. ROSSMANN: -- of geese that are provided habitat by agricultural field. If land is fallowed in the Imperial Valley, will that not reduce the habitat available to these geese?

DR. KRANTZ: It may. The agricultural fields are important for grazing birds such as geese.

MR. ROSSMANN: And looking also at Page 15, impacts to agriculture.

DR. KRANTZ: Yes, sir.

MR. ROSSMANN: It seems that there is a tradeoff here, if I am reading correctly. For every gallon of water transferred out of the basin, there is less water available for agriculture, and that all of that water transfer means less water flowing into the Sea; is that correct?

DR. KRANTZ: I believe so, yes.

MR. ROSSMANN: Is that also true from fallowing?

DR. KRANTZ: It may or may not. It depends on the nature of the fallowing, how that is accomplished, what kind of crops may be fallowed.

MR. ROSSMANN: There may be a fallowing technique that would result in a -- that would also result in a loss of water to the Sea?

DR. KRANTZ: Certainly.

MR. ROSSMANN: I'm interested in the graph you showed, and I see also, I guess it is reproduced here, about the health impacts on children in the Imperial Valley. It is apparently on Page 18 of Exhibit 1.

DR. KRANTZ: Right. That is a partial graph of the one that I exhibited on the Power Point presentation.

MR. ROSSMANN: What I couldn't read while it was up there, and I am just asking you, what is the source of that graph?

DR. KRANTZ: It's the -- I believe -- let me check here

real quick. It is the California County Asthma Hospitalization Chart Book, California Department of Health Services.

MR. ROSSMANN: You didn't participate in the preparation of that?

DR. KRANTZ: No, not at all.

MR. ROSSMANN: I'm not going to ask you any further questions on that.

Now, economic impacts. On the back page of your document you list two citations. One is the 1999 Rose Institute study, and the other is a paper prepared by a Dr. Bazdarich.

You don't happen to have either of those papers with you this morning, do you?

DR. KRANTZ: I do not.

MR. ROSSMANN: Are you familiar with both of the papers?

DR. KRANTZ: I am familiar with both of them.

MR. ROSSMANN: Can you please describe the Rose study?

DR. KRANTZ: The Rose study was engaged by the Rose Institute at Claremont College to look at the potential impacts and benefits to the regional economy from a restored versus an unrestored Salton Sea. And in that analysis, if I may summarize their conclusions, they determined that an unrestored Sea would result in economic -- negative

economic, impacts of greater than a billion dollars a year annually, and that a restored Salton Sea would generate more than that amount, in several billions of dollars of revenues.

MR. ROSSMANN: Let's focus on the billion dollar potential loss.

Was there a breakdown of what the loss would be within Imperial County?

DR. KRANTZ: I don't recall. Dr. Bazdarich's study did look at property values around the Sea and his would be broken down by county.

MR. ROSSMANN: Let's focus on that one, then.

Do you recall what his projection was? And I assume that his paper was designed to illustrate what the economic impacts would be if the Sea were to decline?

DR. KRANTZ: As I recall, he estimated there would be $250,000,000 in property losses alone.

MR. ROSSMANN: Let me ask, sir, and I will ask your attorney to help me if I could get a copy of those reports when you return home, that would be helpful.

DR. KRANTZ: Sure.

CHAIRMAN BAGGETT: I assume copies will be provided to all.

MR. ROSSMANN: Sir, if we decide -- I want to be fair to the witness. And we would like to look at those. We may

decide to do nothing with them. But if we decide to bring them in in rebuttal, then we will share them around, if that is permissible to the Chair.

CHAIRMAN BAGGETT: That is.

MR. ROSSMANN: Dr. Hurlbert, your Mono Lake experience brought back some old memories, so let me ask you to focus on that.

First of all, when you said that Mono Lake was not comparable, you were not addressing air quality impacts in that comparison, were you?

DR. HURLBERT: No. Although when the level of Mono Lake dropped, following the beginning of diversions in 1940, there was an exposure of shoreline up there, and there were salt storms when they had winds up there. But the -- and they may have been a problem for people at Lee Vining. I don't recall that. That would have been an increasing issue if the level continued to drop. It was an issue, as I recall, in the litigation over Mono Lake.

MR. ROSSMANN: You are not an expert in air quality?

DR. HURLBERT: No.

MR. ROSSMANN: Were you a witness either before this Board or before Judge Finney in the Mono Lake proceeding?

DR. HURLBERT: No.

MR. ROSSMANN: Your Honor, I think those are all the questions I have.

CHAIRMAN BAGGETT: Thank you.

Defenders of Wildlife?

MR. FLETCHER: I have nothing. I think I will sit back here.

CHAIRMAN BAGGETT: I'm sorry, National Wildlife. Are they here?

Audubon.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE
BY NATIONAL AUDUBON SOCIETY - CALIFORNIA
BY MR. YATES

MR. YATES: Mr. Chairman, I just would like to follow up on Mr. Rossmann's questions of Dr. Krantz. In this, I believe it is Exhibit 16, the Salton Sea Authority exhibit, Page 3, which is in the middle section, cites to a report by Sykes, Godfrey Sykes who wrote several scientific articles on the Colorado River Delta.

MR. SLATER: Counsel, I'm sorry, are you again referring to the August --

MR. YATES: The August 2001 reprint that Mr. Rossmann presented, Exhibit 16, is within a series of these newsletters from the Salton Sea Authority.

MR. SLATER: Thank you, counsel.

MR. YATES: Page 3, which is the middle panel of this, talks about a number of smaller lakes existed after 1600,

including nine during the 1800s. Is that not correct? It says at the fifth paragraph down, near the bottom of that text, right above the picture of the pelican.

DR. KRANTZ: Yes, sir. I am familiar with the Sykes.

MR. YATES: That Sykes report was Audubon-PCL joint Exhibit 3, is it not?

DR. KRANTZ: I believe so, yes.

MR. YATES: In that it talks about the inundation that occurred in 1840, probably when the New River was formed?

DR. KRANTZ: Right.

MR. YATES: 1842, 1852, '53, '59 and '67, right?

DR. KRANTZ: Yes, sir.

MR. YATES: Thank you.

And also attached as exhibits is the Cory monograph at Exhibit 4. Are you familiar with that in your research in preparing your work?

DR. KRANTZ: Yes. That included some of the historical photographs that were done.

MR. YATES: Are you familiar with the work of Dr. Philip Wilke?

DR. KRANTZ: Yes.

MR. YATES: Is his work cited in your work as far as the archeological studies that have been done?

DR. KRANTZ: Yes. This cited together with Michael Waters and Dr. Schaefer. They independently arrived each at

their own chronology of the Lake Cahuilla periodicity, and those were broken down by something like 65 to 55 percent of the time, they ranged and estimated the period that it was full between -- in the last 1300 years of record.

MR. YATES: Are you familiar with the work of an archeologist by the name of Laylander who put together a recent 1997 analysis of the last days of Lake Cahuilla, the Elmore site which is attached as Exhibit No. 9, PCL and Audubon exhibits?

DR. KRANTZ: No, not familiar with that.

MR. YATES: Are you familiar with the book that was prepared, authored, by William deBuys, Land and Water in Low-Down California, Salt Dreams?

DR. KRANTZ: Yes, I am.

MR. YATES: Are you familiar with the summaries that he did of the former Lake Cahuilla?

DR. KRANTZ: Yes, I am.

MR. YATES: And also the citations in that book to the Sykes and Blake and others that did the observations of the historic inundations?

DR. KRANTZ: Yes. Those were -- reiterates those other citations as well and describes it in very compelling prose. And I believe he actually includes in there some have or might have been in Blake's where he actually includes first-hand accounts of oral histories passed down

by the Torres-Martinez desert Cahuilla Indian peoples of these periodic inundations.

At times during one of the 1800 inundations, there was a downpour and the Indians would harvest salt off the plya. They all ran for -- they left their counterparts standing on the salt flat and ran high ground for fear, from these stories, that the whole lake basin could fill quite rapidly.

MR. YATES: That is all.

CHAIRMAN BAGGETT: Mr. Kirk, Salton Sea.

MR. KIRK: I do. It is five to 12. Do you want to -- need me to get started?

CHAIRMAN BAGGETT: How much do you have?

MR. KIRK: I expect half an hour.

CHAIRMAN BAGGETT: Let's take lunch, then. Come back and start at five till one.

(Luncheon break taken.)

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AFTERNOON SESSION

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CHAIRMAN BAGGETT: We are back on the record.

Ready for cross-examination of the first panel from Defenders and PCL by the Salton Sea Authority.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY SALTON SEA AUTHORITY

BY MR. KIRK

MR. KIRK: Most of my questions will be directed to Dr. Krantz and Dr. Hurlbert.

My apologies, Richard.

First set of questions for you, Dr. Krantz. If you could turn towards Page 11 of Salton Sea California Everglades. I don't remember what exhibit.

MS. DOUGLAS: PCL Exhibit 1.

MR. KIRK: PCL Exhibit 1. You presented some of the similar information in a Power Point presentation; is that correct?

DR. KRANTZ: Yes.

MR. KIRK: The potential cause of reduced inflow, on the left side you identified several potential causes of reduced inflows, true?

DR. KRANTZ: True.

MR. KIRK: Transfers, Mexicali wastewater reclamation,

salinity control, canal lining; is that correct?

DR. KRANTZ: Yes.

MR. KIRK: In your Power Point presentation you added one other, and that was entitlement enforcement or changes in the baseline; is that correct?

DR. KRANTZ: Yes.

MR. KIRK: Let's go through each one of those. With the transfers you're assuming there, says 300,000 acre-feet of potential reduction of inflow. I assume you were assuming the transfer would need a proposed project, on-farm conservation?

DR. KRANTZ: We actually calculated the effects of reduced inflow at 30,000 and 500,000 based on the Salton Sea Reclamation Act, which stipulated that both those scenarios would be evaluated.

MR. KIRK: Is it your understanding that a 300,000 acre-foot transfer accomplished through on-farm conservation resulted in about a 300,000 acre-foot reduction of inflow to the Sea?

DR. KRANTZ: Yes.

MR. KIRK: Is it your understanding, and there were some questions earlier about if the transfer was accomplished by fallowing, fallowing could reduce the impacts on the Salton Sea for a similar amount of transferred water; is that your understanding?

DR. KRANTZ: It could in part, I guess, yes.

MR. KIRK: Is it your understanding that, in fact, fallowing could reduce the impacts on the Salton Sea by about a third at worst case for a 300,000 acre-foot transfer, a hundred thousand acre-foot could be reduced to the Salton Sea?

DR. KRANTZ: That is my understanding. It is difficult to gauge what the full impact of that would be. Based on about a third of the water coming off the fields into the Sea that the Imperial Irrigation District presently uses, a reduction of one-third of the 300,000 acre-feet would still be --

MR. KIRK: Thanks.

In fact, potentially ways to fallow to accomplish the transfer and not have a significant reduction on inflow perhaps through consumptive use fallowing. Are you familiar with that term?

DR. KRANTZ: Through consumptive use fallowing, I am not familiar.

MR. KIRK: We will move on. The next potential cause of reduced inflow that you have identified on Page 11 of the referenced report or brochure is Mexicali wastewater reclamation. You identified that might reduce inflows to the Sea by 65,000 acre-feet.

Is that correct?

DR. KRANTZ: That is the amount of water that their wastewater treatment plant presently discharges into the New River.

MR. KIRK: Is there any reduction to date in inflows coming from that?

DR. KRANTZ: No, there is not. In fact, their treatment plant has been supposedly going on-line for several years.

MR. KIRK: What has Mexico's general performance been, but specifically Mexicali's performance in treating its wasterwater flows? Has it made very expeditious progress?

DR. KRANTZ: Not at all. It's been bantered about annually, and it hasn't happened.

MR. KIRK: Even if all of those flows were cleaned up, per se, wouldn't it take Mexicali some effort to redirect those flows, distribution systems, et cetera?

DR. KRANTZ: Take a huge investment and infrastructure for recycled water system.

MR. KIRK: Do you expect that to occur in the near future?

DR. KRANTZ: No.

MR. KIRK: Moving to salinity control, you identified that reduction of inflow could be 110,000 acre-feet per year. I assume, and correct me if I am wrong, is that assuming a 6- to 7,000,000 ton salt removal project per

year?

DR. KRANTZ: The number 110,000 acre-feet or a hundred thousand acre-feet was the number that contains the annual salt load to the Sea with salinity at its present concentration in the Sea. About four and a half million tons of salt are contained in a hundred thousand, 110,000 acre-feet of lands.

MR. KIRK: Were you surprised if that map wasn't exactly correct? It might be 80,000 acre-feet to balance the current salt load?

DR. KRANTZ: Yes.

MR. KIRK: You would be surprised or you wouldn't be surprised?

DR. KRANTZ: No, I wouldn't be surprised.

MR. KIRK: Let's assume that 4,000,000 tons, you say 4,000,000 tons is what's entering the Sea. Correct me if I am wrong, what you are suggesting is that about 4,000,000 tons are added to the Sea if you discount for precipitation, salt precipitation, et cetera, correct?

DR. KRANTZ: That is discounting salt precipitation which tends to remove salt naturally.

MR. KIRK: Say 4,000,000 tons salt control project, let's say for the sake of argument, could be about 70- or 80,000 acre-feet withdrawal from the Sea area, you say?

DR. KRANTZ: Yeah.

MR. KIRK: So this 110,000 could be more -- something in a more aggressive salinity control project; is that a fair assessment?

DR. KRANTZ: Right.

MR. KIRK: In fact, it would be a salinity control project that would involve moving the water from the Salton Sea outside of the Salton Sea?

DR. KRANTZ: Not necessarily.

MR. KIRK: Can you explain?

DR. KRANTZ: It could involve in-basin solar ponds which --

MR. KIRK: In-basin or in-sea?

DR. KRANTZ: In-sea. Where you are actually moving, you're exporting the highly saline water from the open sea into the salt ponds. But the ponds themselves are still within the Sea.

MR. KIRK: You are actually heading in the direction I wanted to take you. In fact, if you put those ponds in the Sea, it wouldn't be the cause of reduced inflow, per se; is that correct?

DR. KRANTZ: Not at all.

MR. KIRK: When you say a hundred ten thousand acre-feet here, it's 70- or 80,000 acre-feet. The effects on reduced inflow are if you are exporting from the Sea itself?

DR. KRANTZ: That's correct.

MR. KIRK: If you put them in the Sea, there would potentially be no impact or less of an impact or even it may be a positive impact on elevation; is that correct?

DR. KRANTZ: Or even positive effect on elevation. For every five square miles or so of solar ponds you displace one foot in elevation.

MR. KIRK: On Page 11, again, the last item on your list was canal lining. There you indicate that could reduce inflows to the Sea by 28,000 acre-feet.

What is that estimate based upon?

DR. KRANTZ: That's a really difficult number to arrive at. It was based upon an environmental impact report that was done for the canal lining project. The numbers range quite widely as to how much water is communicating, percolating through the unlined canals, how much of that gets to the Sea itself.

MR. KIRK: Is the 20,000 acre-feet the upper end of the inflow impacts associated with a Tetra Tech seepage study that was commissioned by the Salton Sea Authority?

DR. KRANTZ: That's right.

MR. KIRK: Would it be a surprise to you to hear that at least the Coachella EIS/EIR indicated no impact on inflows to the Salton Sea?

DR. KRANTZ: Doesn't surprise me a bit.

MR. KIRK: Last item in terms of potential causes or reduced inflow, entitlement enforcement. You added that to your Power Point presentation; is that correct?

DR. KRANTZ: Yes.

MR. KIRK: How much water did you assume would be reduced from the Sea in that scenario?

DR. KRANTZ: Simply taking the assumptions made in the transfer EIS/EIR, that through entitlement enforcement and other actions that would occur with or without the transfer, according to that document, if we take the Sea at 235 below sea level, drop it eight feet from where it is today, that equals a reduction of inflow by about a hundred thousand acre-feet.

MR. KIRK: Would it surprise you to hear -- it sounds like you are somewhat familiar with the transfer EIS/EIR?

DR. KRANTZ: Yes.

MR. KIRK: Would it be a surprise to you that the baseline condition is on the order of 110,000 acre-feet of reduction inflow per year?

DR. KRANTZ: No. Round number.

MR. KIRK: Back on the Database Program itself, Dr. Krantz, the database is repository in part. As part of the database's program responsibility is repository for projects and plans and studies and information related to the Salton Sea region?

DR. KRANTZ: That's true.

MR. KIRK: And the Database Program is actually -- how many documents, et cetera, materials, does the Database Program have in its repository?

DR. KRANTZ: Approaching 5,000.

MR. KIRK: You keep that fairly current?

DR. KRANTZ: Yes. We concentrate -- a lot of that is gray literature and things that are not important, but we keep fairly current on the reconnaissance.

MR. KIRK: Perhaps important to the author, not to the rest of us?

DR. KRANTZ: That's correct.

MR. KIRK: Does the Database Program, to your knowledge, have any EIR/EIS project plan or otherwise a description of entitlement enforcement?

DR. KRANTZ: No.

MR. KIRK: Do you know what I mean when I say entitlement enforcement? To your knowledge, there is no plan that you have that describes what entitlement enforcement is?

DR. KRANTZ: No.

MR. KIRK: Is there an EIS?

DR. KRANTZ: No.

MR. KIRK: To your -- how long have you been involved in the Salton Sea Database Program?

DR. KRANTZ: Four and a half years.

MR. KIRK: In that time are you aware of any actions taken by the Secretary that would reduce -- Secretary of Interior that would reduce inflows to the Sea by 56,000, 57,000 acre-feet of water per year?

DR. KRANTZ: No, none.

MR. KIRK: Are you aware that the transfer EIR/EIS in Appendix F indicates that, in fact, inflows because of entitlement enforcement have already started to occur beginning in the year 2000?

DR. KRANTZ: I am aware that that is stated in the transfer document.

MR. KIRK: Do you know of any substantiation, any evidence, any plans, programs, that describe what happened in the year 2000 to affect that?

DR. KRANTZ: No. In fact, it is indiscernible as to the actual Sea level. We have delineated the Sea level better than anyone else and have corroborated that, correlated the Sea level today with gauging stations, USGS gauging stations and with the inflows, and they say that the Sea is still where it is today.

MR. KIRK: Where is it today?

DR. KRANTZ: It is at -- well, this time of year it's probably at about 227, 228.

MR. KIRK: I would like to head back to that issue in a

minute. A last question related to Page 11 and 12. This map that you show spreading across Page 11 and 12 shows a 300,000 acre-foot reduction and 500,000, that, as I think you pointed out in your Power Point, doesn't actually mirror the actual impacts on the transfer EIR/EIS because of the baseline issue; is that correct?

DR. KRANTZ: Right. That's right.

MR. KIRK: Back to bathymetry, you say the Sea is likely at about 228 to 227 feet below sea level today?

DR. KRANTZ: Fluctuates within a year, give a foot or two, yes.

MR. KIRK: It sounded as if you consider Redlands something of an expert on the lake elevation and at least looking hard at where the lake has been and where it is today.

Can you describe what you have done to determine lake levels?

DR. KRANTZ: Yes. We have delineated the shoreline using high resolution aerial photographs around the Sea, looking at the entire shoreline for two dates upon which the photographs were taken. Then we took the gauging data from those same dates that the photos were delineated upon and obtained the elevation and that exact shoreline delineation.

MR. KIRK: Wasn't there an issue at some point, an

issue, a correction to the data because of diking around the Salton Sea? Can you explain the process that you took to take into account diking around the Salton Sea?

DR. KRANTZ: Some of the land around the Salton Sea, particularly in the southeast, is actually below the surface elevation of the Salton Sea today. And so we simply did a flood-type of map to show elevations based on a particular thing. It would show that this is inundated when actually it is behind the dike.

So we subtracted the diked areas that are below the existing sea level from the total surface area.

MR. KIRK: Did you walk around those at all, or how did you determine where the dikes were?

DR. KRANTZ: Initially from the air photos, and then we did go out to the ground truth?

MR. KIRK: Do you appreciate this phase of the hearing is dealing with environmental issues, fish wildlife issues?

DR. KRANTZ: Yes.

MR. KIRK: It might surprise you to hear that the hearing has also addressed others issues, like flood damage. Let's get into that since you are an expert on bathymetry of the Sea.

You have spent a lot of time at the Salton Sea?

DR. KRANTZ: Yes.

MR. KIRK: Have you witnessed any flood events at the

Salton Sea in your four and a half years?

DR. KRANTZ: No.

MR. KIRK: Have you witnessed any breaches of dikes?

DR. KRANTZ: No.

MR. KIRK: Have you witnessed any sandbagging at the Salton Sea, sandbagging to protect structures, et cetera?

DR. KRANTZ: No.

MR. KIRK: To your knowledge, has anybody witnessed those sorts of events in the past four and a half years?

DR. KRANTZ: They'd have been reported to the Database Program if that's occurred. No.

The flooding that you are speaking about generally occurred in the '50s as increased agriculture -- my understanding of it is that it's a closed basin with increased agricultural production and increased runoff.

MR. KIRK: To your knowledge, didn't it actually include flooding in the '80s as well as the elevation rose into the early '80s?

DR. KRANTZ: Yes, there was.

MR. SLATER: Mr. Chair, seems to me that this testimony or this cross goes well beyond the scope of direct. This witness was not offered for any testimony regarding the flood damage or anything remotely related to that.

MR. KIRK: I will move on, Mr. Chairman.

CHAIRMAN BAGGETT: You can cross on whatever you want

as long as it is within his expertise.

MR. SLATER: Irrespective of whether he proffers testimony?

CHAIRMAN BAGGETT: Yes.

MR. KIRK: Thank you, Mr. Krantz.

Moving on to air quality. Do you remember the Salton Sea Authority Draft EIS/EIR of year 2000 for the Bureau of Reclamation?

DR. KRANTZ: Yes.

MR. KIRK: Did Redlands compare comments on that Draft EIS/EIR?

DR. KRANTZ: No, he did not.

MR. KIRK: He did not?

DR. KRANTZ: He did not.

MR. KIRK: Have you expressed concerns about air quality associated with receding lake levels at the Salton Sea?

DR. KRANTZ: Yes.

MR. KIRK: What are those concerns?

DR. KRANTZ: Well, as a member of the Salton Sea Science Subcommittee and now the Salton Sea Science Advisory Committee, I and several other members of those committees expressed concerns that the reduced inflows could expose significant acreages of sediments and that those could represent a fugitive dust problem.

MR. KIRK: How does the Salton Sea compare areawise, soilwise to Owens Lake or Mono Lake, if you know that information?

DR. KRANTZ: Owens Lake, I am familiar with that. The Owens Lake area has roughly 22,000 acres that are emissive of dust. With the briny pool in the middle.

THE COURT REPORTER: What kind of pool?

DR. KRANTZ: Briny.

MR. OSIAS: I thought you said tiny.

DR. KRANTZ: No, it is not tiny, David. The tiny, briny pool?

The 22,000 acres that actively emit dust, and that is the area that is being proposed for remediation, as opposed to the potential exposures that we have modeled, ranging in the area of 50- to 88,000. So two and a half to four times that area would be exposed to the Salton Sea full transfers.

MR. KIRK: What about soil characteristics, are they different or similar?

DR. KRANTZ: Soil characteristics are somewhat different. The cooler temperatures in Owens Valley promote a different kind of salt formation at the surface that is very light and easily airborne.

However, the Salton Sea sediments themselves, being exposed to much higher temperatures, would assumably form a

crust and then if that crust is abraded it would still generate dust.

MR. KIRK: Did you participate in the Science Office effort to assemble experts to look at this issue of air quality at the Salton Sea?

DR. KRANTZ: Yes, I have participated.

MR. KIRK: What were -- some of the discussion there suggested that a crust might form at the Salton Sea in some areas, correct?

DR. KRANTZ: Right.

MR. KIRK: Some of the discussion suggested that it might form, but it may very well be broken up by recreational use, human activity; is that correct?

DR. KRANTZ: Well, in fact, as was corroborated by Mr. Vogl's testimony regarding the nature of the soils and of the sediments, it is a mix of sand and silt and clay. So many of them are interbedded. And from the air quality committee's discussions, that was perceived to be really problematic in that you get the sandwich -- they roll on the surface or saltate, bounce. They abrade the other finer sediments that then become airborne.

Another difference at the Salton Sea is that you have active sand sources of sand dunes at the southwest end of the Sea, around the test base, and at the northwest end of the Sea, around the Whitewater River Delta up in the

Coachella Valley. These act as up wind sand sources, that will then blow across the exposed lake bottom sediments.

In one major event, one significant wind event of greater than 17 miles an hour, according to the committee, you could abrade and completely breakdown the salt crust.

MR. KIRK: In your opinion, do you think there could be some very significant air quality problems associated with receding lake level of the Salton Sea?

DR. KRANTZ: Certainly so. Just by orders of magnitude. Again, the areas of exposure are so huge, would be so large, and they have these other extenuating circumstances.

MR. KIRK: Thank you.

Dr. Hurlbert.

DR. HURLBERT: Good afternoon.

MR. KIRK: Good afternoon.

A little on your background again. Were you selected by the Science Office -- I think you said this in your direct. Were you selected by Science Office to prepare an assessment of the Pacific Institute proposal?

DR. HURLBERT: Yes.

MR. KIRK: Were you selected in part because of your expertise with the biology of Salton Sea and your long history at the Salton Sea working on various components of its ecology?

DR. HURLBERT: Probably in part because of that and in part because Milt was desperate.

MR. KIRK: Fair enough.

You are familiar, obviously very familiar, with the Salton Sea. You are also familiar with other inland bodies of water?

DR. HURLBERT: Yes.

MR. KIRK: Could you summarize -- actually let me walk you through it. Your study that you prepared, you prepared that in conjunction with a team of other scientists. Could you briefly describe those scientists and others that participated in that engagement?

DR. HURLBERT: There were about 30 scientists and engineers of diverse sorts who were selected and invited by the Salton Sea Science Office to meet. At first they met in small workshops of five to ten people each, and then they met again for a larger joint workshop, just before the Salton Sea Symposium. And, basically, it was the exchanges at those meetings were put in the form of notes, and those notes with other documents were used to prepare the final evaluation report.

MR. KIRK: Could you describe the -- we'll go through and talk about the results of that effort and report itself.

Did the scientists and your authorship of the report

suggest any major concerns with water quality from the approach offered by the Pacific Institute?

DR. HURLBERT: Yes. The major concerns had to do with the fact that these impoundments which were going to totally roughly 12 percent of the area of the present Sea, a long, narrow one at the south end and a much smaller one at the north end, were effectively going to represent sluggish extensions of the rivers that fed into them, the New, Alamo and Whitewater, and so the water quality in the impoundments would strongly reflect the present water quality in those rivers. And in particular selenium was a major concern there. Because the present Salton Sea has selenium something on the order of one part per billion. And in the southern impoundment in particular, the impoundment would have levels of selenium in the water that would be roughly six times that. And that would presumably have consequences for the food web, fish and birds, as well as for anybody who might be eating fish from those impoundments.

MR. KIRK: Let's talk about biologic impacts.

Were there concerns about the ability of these ponds to replace the present biological resources of the Salton Sea?

DR. HURLBERT: Yes. It would be -- basically, I think the conclusion was that it would be a very expensive way to create a catfish and tilapia fishery that would be a pale shadow of the present fishery in the Salton Sea. The area

would be, as I said, about 12 percent of the present Sea. So the first order approximation would be 80-percent, 88-percent reduction in fish production, perhaps.

MR. KIRK: What about birds?

DR. HURLBERT: Basically, that would be a corresponding reduction in the amount of food available to the fish eating birds. These would be a very different system. Since they would be essentially freshwater impoundments, they would probably have a much greater diversity of fish in them. In addition to the tilapia and the carp and catfish, you'd probably have bass and sunfish and so on. But still the present production of the Sea is utilized by, for example, the pelicans which feed in particular portions of the Sea, not uniformally over the Sea. They are utilizing the fish production that is generated over the entire area of the Sea.

MR. KIRK: In our direct testimony, did you describe and/or define what eutrophic conditions mean?

DR. HURLBERT: I may not have defined. But basically eutrophication refers to the complex set of consequences when you have high amounts of plant nutrients entering a water body, leading to an increased productivity throughout the food list.

MR. KIRK: Would we expect this pond or this pond, southern or northern impoundments, to be eutrophic?

DR. HURLBERT: It would be eutrophic. It's hard to say whether it would be more or less eutrophic than the present Sea, but it definitely would be highly eutrophic since its low salinity water there is potential for other types of algae, some of which are toxic to developing high populations.

MR. KIRK: Would the Sea increase evaporative surface area outside of the remaining Salton Sea?

Restate.

Would these impoundments lead to further reductions or receding of the main body of the Salton Sea?

DR. HURLBERT: The impoundments by themselves would not, but the impoundments were suggested on the assumption that there was going to be a reduction in inflows. So if there was no reduction in inflows, and you created the dams --

MR. KIRK: Under the proposed water transfer project, if this was implemented, in fact, it would be outside of the Salton Sea, or much of it would be outside the Salton Sea, would it not?

DR. HURLBERT: You would have -- if the water transfers went through?

MR. KIRK: Yes.

DR. HURLBERT: With the --

MR. KIRK: As proposed.

DR. HURLBERT: Then the residual portion of the Salton Sea would become a very highly saline lake. I think about 25 feet below the level of the level impoundments.

MR. KIRK: Dr. Krantz, can you corroborate, in fact, these -- the Pacific Institute proposal would lead to increasing salinity and increasing -- further receding of the Salton Sea?

DR. KRANTZ: Yes. It not only takes into account the reduction based on water transfer, but also then holds up some remaining water in the impoundments themselves, so the resulting exposure is greater toward the remaining remnant Sea.

MR. KIRK: That could exacerbate air quality, aesthetics, other issues?

DR. KRANTZ: Has the same potential and about the same acreage is exposed, about 57,200 acres.

MR. KIRK: Dr. Hurlbert, what about bird disease? Were there concerns about these relatively freshwater, brackish water impoundments exacerbating bird disease problems at the Sea?

DR. HURLBERT: There was. That is a little more difficult to predict what might happen there because you're going to have different types of fish, different types of microorganisms. You're going to have different water quality. But the fish in those impoundments would be much

more heavily loaded with parasites than fish in the present Salton Sea.

The high salinity of the present Salton Sea functions essentially as a prophylactic, so that the levels of parasitization of fish in the Salton Sea are lower than just about any other water body around.

MR. KIRK: Do you swim in the Salton Sea?

DR. HURLBERT: Yes.

MR. KIRK: Do you fish in the Salton Sea?

DR. HURLBERT: I fish with gill nets.

MR. KIRK: Do you eat the fish in the Salton Sea?

DR. HURLBERT: Yes.

MR. KIRK: Would you swim in one of those impoundments?

DR. HURLBERT: No.

MR. KIRK: Would you fish in one of these impoundments?

DR. HURLBERT: No.

MR. KIRK: Would you eat the fish out of one of these impoundments?

DR. HURLBERT: No.

MR. KIRK: Did your report suggest there may be some recreational impacts? Would we, in fact, create recreational opportunities that were lost at the Salton Sea? Would it be a net loss or net gain?

DR. HURLBERT: The only positive thing I think you could say for recreational effects, since they would be

greatly reduced in size, water bodies relative to the Salton Sea, you could have more people out there with row boats, perhaps. But because the level of contaminants in the fish are likely to be higher, because the fish are likely to have higher parasite-type loads, because as soon as you have these freshwater impoundments you would have roughly an extra 50 miles of shoreline, which is freshwater shoreline, saltwater shoreline now, that shoreline would be colonized by vegetation, both submerged and shoreline vegetation, salt cedar.

So you'd create an extra 50 miles of sort of marsh, shoreline marsh habitat, which would be good mosquito habitat. There are two types of encephalitis, in particular, that were already in the birds in the region. That would be -- could be transmitted by those particular mosquitoes.

MR. KIRK: Was this a cheap proposal offered by the Pacific Institute, inexpensive proposal offered by Pacific Institute?

DR. HURLBERT: No. The cost estimates of the original proposal were low because they were based on the assumption that you could have a, I'm not sure what the correct engineering terms would be, sort of a low technology dike. And what we were told by the engineers was that you'd actually need something that met the seismic and hydraulic

standards of the dam.

So estimated cost was on the order of a billion dollars just for the dams themselves.

MR. KIRK: Did the Pacific Institute proposal include a proposal to construct 9,000 acres or thereabouts of wetlands as well?

DR. HURLBERT: Yes. I think the Pacific Institute proposal proposed treatment wetland, but did not specify the 9,000. That figure came later from some engineers who were estimating the amount of treatment wetlands you would need to achieve a certain degree of water quality improvement.

MR. KIRK: Do you remember the estimated cost of those 9,000 acres?

DR. HURLBERT: That was on the order of $450,000,000.

MR. KIRK: So the total project cost for this partial solution was 1.5 billion or thereabouts?

DR. HURLBERT: Yes. Although the people said that they could probably get economies of scale when you went to 9,000 acres of wetlands. The cost of those could come down.

MR. KIRK: Are you familiar with the proposed Habitat Conservation Plan No. 1 proposed by IID to mitigate the impacts of the proposed project?

DR. HURLBERT: Yes.

MR. KIRK: Are you familiar that there have been estimates of building 5- or 6,000 acres of ponds?

DR. HURLBERT: Yes.

MR. KIRK: You've heard that those ponds may be fed by either Colorado River water or New River water or some other source within the Imperial Valley?

DR. HURLBERT: Yes.

MR. KIRK: Can you compare that proposal, what you know of it, to the Pacific Institute proposal and your assessment of it?

DR. HURLBERT: I gather that it would be a lot cheaper. In all other respects it sounds to me like it would be worse. Those ponds would come to -- the Pacific Institute impoundments were about 12 percent of the total present area of the Sea, and these ponds would be on the order of 2 percent. So you are talking about very tiny -- you are talking about a 98-percent reduction of habitat that is producing fish.

And the water quality in those impoundments would be a big -- strongly affected by which of those water sources was used. And if it was, in fact, the New River, you would have an even more extreme degree of the same contaminant problems, particularly selenium, than you have in the Pacific Institute impoundments. There are other problems because these ponds would be smaller in scale, shallower. The temperature extremes would be greater, so they tend to be higher water temperatures in the summer, colder in the

winter.

In the case of tilapia, which is the only fish to be raised in them, as I understand it, they probably would have to be heated if you were going to avoid tilapia dying off in the winter.

MR. KIRK: Similar issues with respect to bird disease and to other issues that were raised during the analysis of the Pacific Institute proposal?

DR. HURLBERT: Yeah. Potentially selenium could -- if those ponds developed their own food webs, but with the water having much higher selenium levels than the present Salton Sea has, selenium could become a severe problem. If you get a lot of vegetation, vegetation could pose a lot of problems, some of them with respect to mosquito habitat. Just the general problem of maintaining the vegetation that naturally would start developing around those ponds.

MR. KIRK: A related question back to you, Dr. Krantz. Back again on Page 11 and 12 of PCL Exhibit No. 1. You identified potential causes of reduced inflow. You didn't actually account for reduction in inflow due to the proposed HCP No. 1, did you?

DR. KRANTZ: No, we didn't.

MR. KIRK: Do you account for -- you said you did not account for 5- or 6,000 acres of ponds constructed upstream?

DR. KRANTZ: No.

MR. KIRK: If those ponds were fed with water that now is running to the Salton Sea, would there be a reduction of flow to the Salton Sea?

DR. KRANTZ: The reduction is going to be about 5.7 acre-feet per acre of treatment wetlands just due to evaporation.

MR. KIRK: Using my simple math of six, five times six, 5,000 acres times six feet, 30,000 acre-feet of water would be lost to the Salton Sea?

DR. KRANTZ: Just by direct evaporation.

MR. KIRK: That assumes that these ponds, in fact, aren't using more water, provide more water circulating through the reduced stagnant conditions?

DR. KRANTZ: In addition to that there is evapotranspirational loss, which is plants, aquatic vegetation and other things in and around the treatment wetlands transpire water in addition to the evaporative loss. So there would be additional losses there.

MR. KIRK: To your knowledge, was that impact assessed in the transfer EIS/EIR?

DR. KRANTZ: It was not.

MR. KIRK: To your knowledge, Dr. Hurlbert, was it addressed in the EIS/EIR?

DR. HURLBERT: I don't recall that.

MR. KIRK: Mr. Hurlbert, it's also been -- it sounds as

if, and correct me if I am wrong, Dr. Hurlbert, you would -- you are not supportive of the Pacific Institute proposal as an appropriate way and effective way of replacing habitat in the Salton Sea?

DR. HURLBERT: It would seem a very large expense for a very small benefit.

MR. KIRK: What is your general assessment of the HCP No. 1, the 5- to 6,000 acres of ponds?

DR. HURLBERT: A moderate expense for even smaller benefit.

MR. KIRK: Let's try Alternative No. 3. What about replacing habitat by spending a few dollars in the Mexican portion of the Colorado River Delta? We've heard that. Have you heard that suggested before?

DR. HURLBERT: Yes.

MR. KIRK: Is that an effective way of replacing the fish and wildlife resources at the Salton Sea?

DR. HURLBERT: No. Those are very different sets of habitats down there with very different sets of bird assemblages and fish assemblages.

MR. KIRK: Can you describe those sorts of assemblages in the Mexico portion of the Delta?

DR. HURLBERT: That is pretty complex. There are river channels down there of which some of them have small amounts of water most of the time, like the Rio Hardy channels over

by the San Luis. Some have flow only when there is extra water coming across the border, el nino years. The Rio Hardy Wetlands, which mostly don't exist now, greatly reduced in size after there was a washout of a natural berm with 30,000 hectares of lagoons and channels.

On the other side, there is the Cienega de Santa Clara which is a giant combination cattail marsh and shallow salt lake, that's on the order of 25, 30 miles long, major habitat for clapper rails and various other birds. That is under threat from a variety of sources.

MR. KIRK: Dr. Hurlbert, if we spent the money that would have went to the Pacific Institute proposal or perhaps to these IID fish ponds down in the Mexican portion of the delta, could we mitigate the impacts of a lost Salton Sea, or significantly changed Salton Sea or degraded Salton Sea?

DR. HURLBERT: I think it would be -- you could tremendously improve wildlife habitat down there if you spent a billion dollars; that is for sure. But you're basically improving other types of habitats in another region, possibly making up for some of the damage done to environments that used to rely on the annual flooding and receding of the Colorado River. But it is a completely different system.

MR. KIRK: Dr. Hurlbert, I heard you describe the Salton Sea and compare it to places like Lake Tahoe. How

would you characterize Lake Tahoe to the Salton Sea in terms of biodiversity and abundance for biological resources?

DR. HURLBERT: Lake Tahoe has, thanks to the work of researchers at U.C.D., Charles Goldman and other people, it's got very low amounts of nutrients coming into it, and that's why it doesn't have much algae, and that's why the water is so clear. That's way it doesn't produce many fish. That's why you hear a loon out there once in a while, but you don't see hundreds of thousands of birds on the lake. It's a biological desert, essentially, albeit an attractive one.

MR. KIRK: And the Salton Sea?

DR. HURLBERT: That is a biological gold mine, tremendous diversity of organisms at many levels in the food web.

MR. KIRK: Last question for the panelists, and I am not asking for your legal opinion here.

Are you aware that the IID, before this Board 15 years ago or thereabouts, argued that water flowing into the Salton Sea was a reasonable beneficial use of water?

DR. HURLBERT: Yes.

MR. KIRK: Do you believe today that water flowing into the Salton Sea serves a reasonable and beneficial use for wildlife resources, Dr. Krantz?

DR. KRANTZ: Certainly.

MR. KIRK: Dr. Hurlbert?

DR. HURLBERT: Certainly.

MR. KIRK: Mr. Vogl, who used to be a Dr. Vogl?

MR. VOGL: Yes, definitely.

MR. KIRK: Thank you very much.

CHAIRMAN BAGGETT: Thank you.

Mr. Slater, San Diego.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY SAN DIEGO COUNTY WATER AUTHORITY

BY MR. SLATER

MR. SLATER: Afternoon, gentlemen. I would like to start with Dr. Krantz, please.

Do I understand from your testimony that you are not opposed to all aspects of the IID/San Diego transfer?

DR. KRANTZ: I don't think I testified to that effect. But could you elaborate, please?

MR. SLATER: Are you opposed to IID's agreement to make conserved water available to San Diego County?

DR. KRANTZ: Yes. The key word there being conserved. What is conserved water?

MR. SLATER: I will follow up with that.

Do you have any concerns about how the water is conveyed from Imperial to San Diego County?

DR. KRANTZ: The mechanical means of wheeling it?

MR. SLATER: Yes, correct.

DR. KRANTZ: No.

MR. SLATER: Do you have any concerns related to Imperial's proposed agreement to forebear or reduce its diversions or limit to a 3.1 cap, 3.1 million acre-feet?

DR. KRANTZ: I am not really familiar with those numbers. That is about the entire amount used by the Imperial Irrigation District today; is it not?

MR. SLATER: Let me ask it this way.

Are you opposed to the Imperial Irrigation District's agreement to limit its -- quantify its water use, holding aside the question of how they conserve the water to make it available?

DR. KRANTZ: I understand the need to quantify their use.

MR. SLATER: Do you have any concerns about the financial terms of the arrangement between San Diego and Imperial, in other words, what San Diego is paying Imperial for the water?

DR. KRANTZ: I don't have any concerns about that.

MR. SLATER: Specifically, you mentioned that you had some concerns related to how the water was conserved; is that correct?

DR. KRANTZ: Yes.

MR. SLATER: What would those concerns be?

DR. KRANTZ: Well, if it is on-farm conservation and then recollecting and transferring water before it gets to the Sea, then that would certainly have potential impacts on the Sea.

MR. SLATER: What do you mean by on-farm conservation?

DR. KRANTZ: Where it's -- the tailwater coming off from the farms would be transferred, so you can have all the conservation you want in the fields, but if the net result is a reduction of inflows to the Sea, then it would have potential impacts.

MR. SLATER: The test is potential impact on potential inflow to the Sea?

DR. KRANTZ: That's true.

MR. SLATER: Were you here yesterday to hear the testimony of Mr. Kirk?

DR. KRANTZ: No, I was not.

MR. SLATER: I would like to read something to you and see if you would agree with it.

Mr. Kirk, in his written testimony on Page 2, stated if conservation methods are mitigated as suggested in the transfer EIR Habitat Conservation Plan 2 or implemented through a water generation alternative that employs fallowing, most of the concerns I have surmised will vaporize or diminish.

Do you agree or disagree with that statement?

DR. KRANTZ: It has potential to reduce impacts to the Sea, yes.

MR. SLATER: Dr. Hurlbert, good afternoon.

DR. HURLBERT: Good afternoon.

MR. SLATER: I think your testimony is to the effect that if the water transfer is carried out as planned, it will have the effect of either, one, increasing the rate at which the Sea becomes more saline and, two, in turn this will have dramatic impacts on the Sea ecosystem.

Is that roughly correct?

DR. HURLBERT: Yes.

MR. SLATER: Can you tell us what aspects of the transfer would cause that impact?

DR. HURLBERT: Any aspects that resulted in reduced inflows.

MR. SLATER: So, again, you agree with Dr. Krantz that it is the inflows to the Sea that is the critical question; is that correct?

DR. HURLBERT: For somebody focusing on the Sea as opposed to, say, San Diego.

MR. SLATER: As opposed to the balance of issues. Okay.

You don't have any problem with the way the water is conveyed to San Diego County, correct?

DR. HURLBERT: No.

MR. SLATER: No specific problem with IID's willingness to forebear or cap its water use at 3.1 million acre-feet?

DR. HURLBERT: I would have to say I am not qualified to give an opinion on that.

MR. SLATER: That is fine.

Mr. Vogl, I believe you testified about impacts related to sediment contamination, correct?

MR. VOGL: Correct.

MR. SLATER: Same set of questions to you.

If we adopted -- if we -- Strike that.

Is your chief concern related to reduction of inflows into the Sea?

MR. VOGL: The change in inflow, if there is a reduction and/or quality of the inflow could have an impact on the constituents, chemicals.

MR. SLATER: Were you here yesterday to hear Mr. Kirk's testimony?

MR. VOGL: No, I wasn't.

MR. SLATER: Did you hear me read that paragraph a couple minutes ago? Would you like me to read it again?

MR. VOGL: Sure.

MS. DOUGLAS: If I could intervene for a minute, Mr. Slater. I think it would be helpful to give some background as to HCP2 and 3, just to explain the testimony a bit. I am not so sure that all my witnesses are that familiar with the

HCP proposal.

MR. SLATER: That's fair.

Mr. Vogl, are you familiar with HCP2?

MR. VOGL: No.

MR. SLATER: Are you familiar with the Alternative 4 to the EIR/EIS?

MR. VOGL: No, I'm not.

MR. OSIAS: Mr. Slater, you mean the transfer EIR/EIS?

MR. SLATER: The transfer EIR/EIS.

So you are not? Are not?

MR. VOGL: No.

MR. SLATER: But again, it's your testimony that the key concern is reduction of inflows into the Salton Sea, correct?

MR. VOGL: Correct.

MR. SLATER: No further questions.

CHAIRMAN BAGGETT: Thank you.

Mr. Osias.

MR. OSIAS: It will take me a few minutes to move all my stuff.

MS. DOUGLAS: Can we have a three-minute break while he moves his stuff?

CHAIRMAN BAGGETT: Sure, let's take three minutes. Stand up and stretch.

(Break taken.)

CHAIRMAN BAGGETT: Back on the record.

Mr. Osias, you are up.

MR. OSIAS: Thank you.

Good afternoon to all of you, Doctor, Doctor and Mr. Dr. Hurlbert, is that as I said?

DR. HURLBERT: Yes.

MR. OSIAS: You have been working professionally in connection with the Salton Sea for quite a long time?

DR. HURLBERT: That's correct.

MR. OSIAS: And, I guess, since the formal creation of the Salton Sea Authority, you have had dealings with them?

DR. HURLBERT: Yes.

MR. OSIAS: I don't mean to say that you are an employee, but you've done work for them in various ways, correct?

DR. HURLBERT: Yes.

MR. OSIAS: You're aware that the Authority coupled with the Bureau of Reclamation released in 2000 a Salton Sea Restoration EIR/EIS?

DR. HURLBERT: Yes.

MR. OSIAS: You hesitate. You know about that document?

DR. HURLBERT: I know about that document, yes.

MR. OSIAS: Did they ask you to help or consult on that in any way?

DR. HURLBERT: I can't remember. I am always giving

advice, whether asked for it or not. It is hard to remember these things. I would have to go back three years or so.

MR. OSIAS: Let me change my question slightly, because even if they didn't ask, did you consult or offer advice regarding that document?

DR. HURLBERT: I have no specific recollection.

MR. ROSSMANN: When it came out, did you submit any comments on it?

DR. HURLBERT: I think I did not submit any formal set of comments.

MR. OSIAS: I am going to have Mr. Hattam hand you a copy of that, of the Salton Sea Restoration EIR/EIS. We are unfortunately without the CD so we couldn't put it up. But I'm just going to ask you to look at one page, actually look at the title page so you know what it is you are seeing. If you would turn to Page 4-102.

Do you see that page?

DR. HURLBERT: Uh-huh, yes.

MR. OSIAS: Thank you.

Let me just caution all of you, what happened yesterday, the nods of the head and the uh-huhs have to be changed into yeses or nos for the reporter.

Do you see Table 4.6-3 at the top of that page?

DR. HURLBERT: Yes.

MR. OSIAS: It has three columns. The left-hand column

says species?

DR. HURLBERT: Correct.

MR. OSIAS: Under which there is the corvina, the sargo, the pileworm, the gulf croaker, the tilapia, pupfish, Long John mudsucker and the sailfin molly, correct?

DR. HURLBERT: Correct.

MR. OSIAS: Then there are two columns entitled year of impact at 1.06 million acre-feet per year inflow condition and the other column year of impact at 1.36 million acre-feet per year inflow condition.

Do you see that?

DR. HURLBERT: Yes.

MR. OSIAS: Under each of the columns you see the year in which it is estimated that the species cannot complete its life cycle, correct?

DR. HURLBERT: Yes.

MR. OSIAS: So, for example, for corvina that's estimated to be for both inflow conditions the year 2000, correct?

DR. HURLBERT: Apparently so.

MR. KIRK: Mr. Chairman, I object. The Draft EIR/EIS is not available to the rest of us. I understand that it is going to be part of the rebuttal. It should be presented as a part of that rebuttal evidence. I don't have a copy in front of me. I assume the rest of the participants don't

either.

MR. OSIAS: Which is why I am saying what it says.

CHAIRMAN BAGGETT: Overrule. He is reading the column. He is reading the table, correct?

MR. KIRK: I guess we will have to take his word for it.

MR. OSIAS: Well, no, I think we could take Dr. Hurlbert's word for it.

CHAIRMAN BAGGETT: The witness is asked --

MR. OSIAS: He's answered yes to every question.

Thank you.

And I am pressed for time.

CHAIRMAN BAGGETT: I understand.

MR. OSIAS: As to those two inflow conditions for corvina, no change was identified, correct?

DR. HURLBERT: Correct.

MR. OSIAS: And if we go down to sargo in the 1.06 million acre-feet inflow condition, the date is 2009, correct?

DR. HURLBERT: Yes.

MR. OSIAS: If 1.36, it is 2013, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So a four-year impact there, correct?

DR. HURLBERT: Correct.

MR. OSIAS: For the pileworm, if I could drop the year

2000, the difference is between the year '16 and the year '29, correct?

DR. HURLBERT: Correct.

MR. OSIAS: That is a 13-year difference, correct?

MR. OSIAS: For the croaker the comparison is from the year '21 to the year '44, correct?

DR. HURLBERT: Correct.

MR. OSIAS: The difference there is 23 years?

DR. HURLBERT: Yes.

MR. OSIAS: For the tilapia the comparison the year 25 to the year 59?

DR. HURLBERT: Correct.

MR. OSIAS: So that is a 34-year difference.

And for the pupfish the difference was '30 to '88, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So a difference of 58 years.

And then the last, at least under the inflow condition of 1.36 it says beyond 2100, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So I can't actually do the math because I don't know what the other number is. In the 1.06 million column for the mudsucker is 2033, correct?

DR. HURLBERT: Correct.

MR. OSIAS: For the molly it was 2038?

DR. HURLBERT: Correct.

MR. OSIAS: I thought I heard you testify that we actually don't know enough about any of these species to identify such information; is that right?

DR. HURLBERT: Pretty much right.

MR. OSIAS: So the Salton Sea Restoration Project EIR/EIS, at least as to this table, is identifying information that you think is not scientifically grounded?

DR. HURLBERT: It is the best, presumably based on the best available. The best available is about 10 percent of what we need to come up with accurate estimates.

MR. OSIAS: So if it was up to you, this kind of information would not be communicated in an EIR/EIS?

DR. HURLBERT: Probably in a different form.

MR. OSIAS: With broader ranges, perhaps?

DR. HURLBERT: The idea of picking critical values is where the problem starts as opposed to working with rough estimates of curves and their position on a salinity graph.

MR. OSIAS: I very much like the graphs you put up, and we don't need to find them. If they were -- they reflected what you called the hump.

Do you know what graph I am talking about?

DR. HURLBERT: Yes.

MR. OSIAS: I think you said as to at least the critical species in the Sea, I assume -- was it just fish

species or all species?

DR. HURLBERT: That would apply to anything. I was talking about those graphs in connection with the fish.

MR. OSIAS: We're on the right side of the hump, meaning the downward side with respect to stress on the animals, correct?

DR. HURLBERT: Correct.

MR. OSIAS: Downward means bad for the species, correct?

DR. HURLBERT: Correct.

MR. OSIAS: You testified you didn't know where we were on that downward side, could be 20 percent towards the demise or 90 percent, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So that uncertainty I assume creates some urgency in addressing salinity problems. Is that fair?

DR. HURLBERT: Yes.

MR. OSIAS: If we were at 90, you'd need to do it faster, right?

DR. HURLBERT: Correct. And funding more research on the salinity, of course.

MR. OSIAS: But because the species are on the downward side of the hump, the current salinity in the Sea is not an appropriate objective for those species, correct?

DR. HURLBERT: No. If you were looking at long-term

management you would shoot for something lower.

MR. OSIAS: To get to something lower, you would actually have to remove more salt than comes in, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So if you were going to remove water from the Sea through solar ponds in order to manage the salinity to improve these stressed species, you would, in fact, take out water that had more salt than the salt that goes into the Sea, correct?

DR. HURLBERT: Yes.

MR. OSIAS: Therefore, when we looked at Dr. Krantz's chart, which was at 110,000 acre-feet, but under the rigorous cross-examination of Mr. Kirk, he admitted that it might be only 80-. They were talking about salt balance which would not be sufficient to push the species back up the hump, correct?

DR. HURLBERT: Correct.

MR. OSIAS: If they were, in fact, at the 90-percent level on the down side of the hump, some significant additional volumes of water would be needed, correct?

DR. HURLBERT: If you wanted to move them back up to the hump, is that --

MR. OSIAS: Right.

DR. HURLBERT: Yes.

MR. OSIAS: Let me just make sure I understand.

It would not be an appropriate plan to keep a species at the 90-percent level on the down side of the hump if you knew they were there, correct?

DR. HURLBERT: You would have to manage the lake for a salinity range, which might be better for some species than others. There is no one magic salinity you want to shoot for.

MR. OSIAS: I'm sorry, my question was not clear enough.

If you actually had done it on research to know that a species was 90 percent to the magic number that we don't know about on that downward slide --

DR. HURLBERT: You say 90-percent reduction from the optimal or maximal reduction.

MR. OSIAS: Yes. So if you knew a species was there, you would have to have much more discrete and accurate salinity control measures because a small change could push it over the edge, correct?

DR. HURLBERT: Yes. Although you could also make the argument that once you'd gotten to that point, there is so few fish of that species left it doesn't make any difference.

MR. OSIAS: That may actually be too far gone to spend money on it. Is that sort of what you are saying?

DR. HURLBERT: No. You could always spend money to bring it back. What I'm saying is the critical point from

the point of view of, say, either recreational fishermen or fish eating birds is not when the population goes extinct, which could happen decades after the population had been brought to a very low level.

MR. OSIAS: I was really trying to get to the point that as we learn more about the species and find out where they are on the hump, if they are in a difficult spot, whatever that percentage would be in your mind, you would have to be more careful about salinity than if they were closer to the optimal where you have more cushion for error?

DR. HURLBERT: Sure.

MR. OSIAS: So, therefore, in determining how much water to remove from the Sea for salinity control, there could be some great range depending upon where the species end up being by degree of their stress, correct?

DR. HURLBERT: Correct.

MR. OSIAS: So it may not be a goal at this point to merely remove the amount of salt coming in because we don't know how stressed the species are, correct?

DR. HURLBERT: Will you repeat that again?

MR. OSIAS: Yes.

It may not be that the appropriate goal is merely to remove the amount of salt coming in because we don't yet know how stressed the species are?

DR. HURLBERT: You would know that -- apparently there

is very good fishing out there. You know that if you remove the salts that were coming, things would not get worse with respect to salinity. And to the extent that -- the judgment made that present fishing conditions are pretty good at least for corvina so far this year, you would justify doing what was needed to keep it at that level, knowing that with a larger investment and bringing it back down a few parts per thousand you could perhaps get better production.

MR. OSIAS: Thank you.

I wasn't suggesting that taking some salt out isn't better than taking no salt out. But in terms of preserving the biodiversity for all the species, you certainly would not necessarily set the goal at the status quo salinity until you knew more about how stressed the species were?

DR. HURLBERT: Correct.

MR. OSIAS: Thank you.

I take it from your comments that you also think identifying 60 parts per thousand as a magic number for which species are in jeopardy, that that is inconsistent with your scientific research and the concept of your hump charts, correct?

DR. HURLBERT: I think that 60 parts per thousand is a number that was put forward solely in relationship to tilapia, not to the other three species.

MR. OSIAS: In what document are you referring to?

DR. HURLBERT: I can't remember which one. But I think there is no question from any biologist's point of view that the marine fish will go long before you get to 60 parts per thousand.

MR. OSIAS: Again, in a document whose focus is on Salton Sea restoration, just identifying 60 parts per thousand as a threshold for which to gauge fish habitat, that is not appropriate, given your research and the concept of your hump charts, correct?

DR. HURLBERT: The general idea of focusing on critical values as a foundation for engineering projects is bad, I would say.

MR. OSIAS: Therefore, comparing a project for when it gets to 60 parts per thousand can be no better; is that correct?

DR. HURLBERT: I would say so.

MR. OSIAS: You have seen the Salton Sea Authority's documents where they do actually make comparison solely on lines which get to 60 parts per thousand?

DR. HURLBERT: Yes, I believe I have.

MR. OSIAS: Thank you.

Now, Dr. Krantz, when was PCL Exhibit 1, your brochure -- actually, could I ask you to put your laptop down, or your screen down?

DR. KRANTZ: Sure.

MR. OSIAS: When was PCL Exhibit 1 printed? It doesn't have a date on it.

DR. KRANTZ: In March this year.

MR. OSIAS: 2002.

DR. KRANTZ: Yeah.

MR. OSIAS: I notice in response to Mr. Rossmann's questions you had us look at the back and you have a heading called references.

DR. KRANTZ: Yes.

MR. OSIAS: Is that, in fact, the source materials under the various headings that you used for this brochure?

DR. KRANTZ: I have fuller citations available.

MR. OSIAS: First you have to answer yes or no.

DR. KRANTZ: Yes.

MR. OSIAS: When you say "fuller citations," you mean you have more complete citations for these documents or you have more documents?

DR. KRANTZ: Both.

MR. OSIAS: So this isn't the complete list of references?

DR. KRANTZ: That's the complete list as cited in there. Some of those citations are abbreviated to a degree that you couldn't go to the particular volume or journal number, et cetera.

MR. OSIAS: We could certainly contact you and get that

information?

DR. KRANTZ: Yeah.

MR. OSIAS: Now if you'll stay on the back, you will notice that under the heading, small print, reduced inflow, do you see that about halfway down?

DR. KRANTZ: With my lasik surgery I can see and read that.

MR. OSIAS: Excellent.

That references as the source materials the draft Salton Sea Restoration Project Environmental Impact Statement and Environmental Impact Report, correct?

DR. KRANTZ: It does.

MR. OSIAS: In fact, you used that document, correct?

DR. KRANTZ: We used it for a number of different things, yes.

MR. OSIAS: That document identifies 1.36 million acre-feet as the baseline, correct?

DR. KRANTZ: I don't recall. 1.36, 1.35, yes, something close to that is my recollection.

MR. OSIAS: You used 1.36 in your brochure, correct?

DR. KRANTZ: Is it 1.36?

MR. OSIAS: I'm looking at Page 11. I am in the first paragraph about five lines down.

DR. KRANTZ: Yeah.

MR. OSIAS: That, to the best of your recollection, is

the same number that was in the Salton Sea Restoration EIR/EIS?

DR. KRANTZ: To the best of my recollection.

MR. OSIAS: Had it been inconsistent, would you have come up with some reconciliation?

DR. KRANTZ: I believe the number now being used is 1.346.

MR. OSIAS: You produced this in March. Why didn't you change that number?

DR. KRANTZ: Can't say.

MR. OSIAS: At least for purposes of this document, 1.36 is close enough for the point it makes, correct?

DR. KRANTZ: Yes.

MR. OSIAS: You weren't here yesterday, I take it?

DR. KRANTZ: No, I was not.

MR. OSIAS: You didn't know that Dr. Brownlie said that, in fact, it was not his opinion that either 1.36 or 1.34 should be used as a baseline?

DR. KRANTZ: No, I didn't.

MR. OSIAS: If I told you that, would you take that number out of the brochure?

DR. KRANTZ: It would be irrelevant because we are simply modeling changes to inflow based on what the inflow is today.

MR. OSIAS: And the inflow has been, I think you said,

fairly steady at 1.36?

DR. KRANTZ: The Sea surface elevation has been fairly steady for the past decade, and the numbers used in those transfer -- in the transfer document and in the restoration EIR/EIS both also use that same number 1.346.

MR. OSIAS: 1.346?

DR. KRANTZ: Yeah.

MR. OSIAS: So anyway, Dr. Brownlie's opinion would be irrelevant to you?

DR. KRANTZ: I'm familiar with Dr. Brownlie's point in the context that he was describing.

MR. OSIAS: You are not familiar?

DR. KRANTZ: No, I wasn't here yesterday.

MR. OSIAS: I want to make sure I heard you. I didn't hear the not.

The science committee and the science subcommittee, are those useful shorthands?

DR. KRANTZ: The science subcommittee, now it's the Science Advisory Committee, yes. Both established under the Secretary of Interior.

MR. OSIAS: And you have been a continuous member, I think you said, in your --

DR. KRANTZ: Yes, I have.

MR. OSIAS: As a member, you participate in the Salton Sea Symposiums?

DR. KRANTZ: Yes. We support that in some ways.

MR. OSIAS: And the --

DR. KRANTZ: The last two.

MR. OSIAS: The last two?

DR. KRANTZ: Yeah.

MR. OSIAS: The Database Program, you are actively involved in that as well, correct?

DR. KRANTZ: Yes. We provide base maps and other imagery to --

MR. OSIAS: I didn't ask you what you did. I asked whether you were involved.

DR. KRANTZ: We do support those endeavors.

MR. OSIAS: Many people use the word "we" because they are immodest --

DR. KRANTZ: We supply data.

MR. OSIAS: You, Dr. Krantz, is what I was asking, are involved with the Database Program?

DR. KRANTZ: Yes.

MR. OSIAS: I think you testified about 5,000 things were deposited there or in the repository. Is that the number you used?

DR. KRANTZ: The graphic library is something like that.

MR. OSIAS: Is Arizona v. California, the Supreme Court decision in there?

DR. KRANTZ: We have some of the adjudication of the river. I'm familiar with that. I am not sure if we have a hard copy of it in our records.

MR. OSIAS: Seven Party Agreement, do know if that is in there?

DR. KRANTZ: Not to my knowledge.

MR. OSIAS: Are you familiar with that?

DR. KRANTZ: Not very.

MR. OSIAS: When Mr. Kirk asked you about whether you have seen any plans to enforce the entitlement levels on the river and you answered no, that didn't mean that the plans were necessary, did it?

DR. KRANTZ: I am unfamiliar with any plans.

MR. OSIAS: Do you believe plans are necessary to enforce the entitlement limit?

MS. DOUGLAS: Objection. It's a legal question.

MR. OSIAS: I'm not asking for his legal opinion. I'm asking for his opinion in the same fashion he gave it to Mr. Kirk.

CHAIRMAN BAGGETT: Overruled.

Answer to the best of your knowledge, or if you can't so state.

DR. KRANTZ: As a past environmental consultant, I think that anything that has a potential adverse impact on the environment is covered under CEQA and NEPA and should

have supporting documentation.

MR. OSIAS: That would include a Supreme Court decision entered in 1964?

DR. KRANTZ: That's a bit before my time. In fact, CEQA and NEPA didn't exist then.

MR. OSIAS: If a decision was made in 1964 that would mandate something next year, would CEQA and NEPA --

MS. DOUGLAS: Objection.

MR. OSIAS: Do you know the answer to the question?

DR. KRANTZ: I don't think there is an answer to that question.

MR. OSIAS: Thank you.

The symposiums, did you attend -- I think you said you attended Salton Sea Symposium IV?

DR. KRANTZ: And the recent one, yes.

MR. OSIAS: That was January this year?

DR. KRANTZ: Yeah.

MR. OSIAS: Do you recall a Power Point presentation by Mr. Kirk, of course, and someone from the Bureau, Mike Walker? Do you remember that?

DR. KRANTZ: I remember vaguely their presentation, yes.

MR. OSIAS: Have you seen that presentation in any time other than at the symposium?

DR. KRANTZ: Not that particular presentation I don't

think.

MR. OSIAS: Is it in the Database Program?

DR. KRANTZ: No.

MR. OSIAS: It's Salton Sea Authority Exhibit 18. Perhaps I can show it to you now. You don't have one here.

Does that look familiar or not?

DR. KRANTZ: They are just title slides, so I can't see if there are other elements that come up in the slide.

MR. OSIAS: The question is: Does it look familiar?

DR. KRANTZ: Not really.

MR. OSIAS: If it doesn't, that's okay.

DR. KRANTZ: Not really. Some of the graphics do, yes.

MR. OSIAS: Would you turn to Page 6?

DR. KRANTZ: Okay.

MR. OSIAS: You see the graph at the lower right-hand corner?

DR. KRANTZ: Right.

MR. OSIAS: Do you see that it predicts the fishery collapse with the current salinity trend between the year 2015 and the year 2035?

DR. KRANTZ: It is hard for me to read what the current trend line is.

MR. OSIAS: Do you see the word "fishery collapse"?

DR. KRANTZ: Yes.

MR. OSIAS: You see there is a line at each end?

DR. KRANTZ: Yes.

MR. OSIAS: You see there is an arrow with an arrowhead underneath the words?

DR. KRANTZ: Yes.

MR. OSIAS: Wouldn't you assume reasonably that the double-headed arrow shows a range between the two lines?

DR. KRANTZ: It shows a period of years, yes.

MR. OSIAS: Aren't those years for this fishery collapse, if you go down to the horizontal axis -- which one is that, X?

DR. KRANTZ: Right.

MR. OSIAS: -- 2015 to 2035?

DR. KRANTZ: More or less, yes.

MR. OSIAS: Thank you.

You knew that information when you prepared your PCL No. 1.

DR. KRANTZ: Yes, I did.

MR. OSIAS: You disagree with that?

DR. KRANTZ: I disagree with that.

MR. OSIAS: Did you make the disagreement known at this symposium?

DR. KRANTZ: No, I didn't.

MR. OSIAS: The Salton Sea, Dr. Krantz, has no water right, correct?

MS. DOUGLAS: Objection. That is a legal conclusion.

MR. OSIAS: Is there evidence of any water right in your repository?

DR. KRANTZ: Not to my knowledge.

MR. OSIAS: Have you seen any documents to suggest that the Salton Sea itself through the Authority or otherwise can order water from the Colorado River?

DR. KRANTZ: I really don't know about that.

MR. OSIAS: Do you know -- you do know it is highly dependent on inflow from agricultural runoff?

DR. KRANTZ: That's right.

MR. OSIAS: Do you believe that the farmers have an obligation to order water from the Colorado River?

DR. KRANTZ: I really don't know much about water in that respect.

MR. OSIAS: So they might have an obligation to order water?

DR. KRANTZ: They may or may not, as far as I know.

MR. OSIAS: I assume if they don't order water, there would be less inflow to the Sea?

DR. KRANTZ: That's presumably true, I guess.

MR. OSIAS: I don't want to guess.

DR. KRANTZ: If everyone decides not to order, yes.

MR. OSIAS: If some decide not to order water and no one else increases their order by a corresponding amount --

DR. KRANTZ: Then there would be a net reduction of inflow.

MR. OSIAS: You testified on direct that the Salton Sea was very sensitive to inflow changes. Do you remember saying that?

DR. KRANTZ: Yes, that's true.

MR. OSIAS: Mark, could you put up Exhibit 11?

This is IID Exhibit 11, which has been accepted into evidence. And that shows the changes from years 1914 to 2000, I believe, in IID's Colorado River diversions.

Have you ever seen either this chart or anything like it before?

DR. KRANTZ: I have seen something like it, yes.

MR. OSIAS: Does it not, in fact, show that IID's water use is somewhat volatile, changing hundreds of thousands of acre-feet from year to year?

DR. KRANTZ: It does appear to indicate that.

MR. OSIAS: Now you say it appears to. Does that mean because you don't believe it?

DR. KRANTZ: I am just studying that.

MR. OSIAS: If you don't use too much time.

DR. KRANTZ: Yes, it seems to fluctuate around 3,000,000 acre-feet.

MR. OSIAS: But the swings are several hundred thousand, correct?

DR. KRANTZ: Yes.

MR. OSIAS: Look at 1992. You see that that was barely above 2.5?

DR. KRANTZ: This is -- you are looking at simply the amount of water they are taking and not other conditions that also affect agriculture in the basin, such as the occasional rainfall.

MR. OSIAS: So it is possible that they diverted in 1992 that little water because it was made up by rainfall that year?

DR. KRANTZ: I see a low period in, it looks like, '93 or something? And to my recollection that was an el nino year.

MR. OSIAS: Let me go back to my question. Please answer what I am asking because I am going to run out of time, which I know won't make anyone upset but me.

In 1992 they used a little more than 2.5 million, correct?

DR. KRANTZ: It looks to be 3,000,000.

MR. OSIAS: In 1992? Maybe my eyes are bad from here.

I am looking at the deep V. If I have the year wrong, tell me what the volume was.

DR. KRANTZ: That is '93 or something.

MR. OSIAS: A little more than 2.5, correct?

DR. KRANTZ: Right.

MR. OSIAS: Then it goes up and we have a hump roughly '98, correct?

DR. KRANTZ: Yes.

MR. OSIAS: That is over -- that is about 3.2, 3.2 million, yes?

DR. KRANTZ: Yes.

MR. OSIAS: That is yes?

DR. KRANTZ: Yes.

MR. OSIAS: You have to answer out loud.

So the difference in those, between those five years is over 500,000 acre-feet, correct?

DR. KRANTZ: Yes. With other extenuating circumstances that we don't understand.

MR. OSIAS: You do understand the average rainfall is about two inches a year out there?

DR. KRANTZ: Two and a half, yeah.

MR. OSIAS: Is it possible that that 500,000 acre-feet was made up with rainfall?

DR. KRANTZ: No, it's not.

MR. OSIAS: Do you think a hundred thousand acre-feet was made up with rainfall?

DR. KRANTZ: I really don't know. It is a big watershed, in a big year, yes.

MR. OSIAS: Is that reflected in any of the material in your repository that you can have weather patterns in the

Imperial Desert where hundreds of thousands of acre-feet are provided by natural rainfall?

DR. KRANTZ: It is very difficult to gauge because it depends on how it falls, how intensely, over what period of time, how much of that goes to groundwater, as is the amount of water they are using for irrigation. There are many other factors between when IID takes the water and how it's used and when it gets to the Salton Sea.

MR. OSIAS: I don't think that was responsive to my question.

Do you think IID uses a substantial amount of groundwater?

DR. KRANTZ: Groundwater is estimated to comprise about 3 percent of the inflow to the Sea. I know that.

MR. OSIAS: That is not my question. Let's practice.

Do you think the IID uses a significant amount of groundwater?

DR. KRANTZ: How do you determine significant?

MR. OSIAS: Do they use 50,000 acre-feet of groundwater in Imperial Valley?

DR. KRANTZ: Really don't know.

MR. OSIAS: Do they use a hundred thousand?

DR. KRANTZ: I don't know.

MR. OSIAS: Do you have any information about how much groundwater Imperial uses at all?

DR. KRANTZ: Not off the tip of my tongue, no.

MR. OSIAS: Or even a range off the top of your --

DR. KRANTZ: No, I don't.

MR. OSIAS: So when you were speculating that perhaps weather or groundwater accounts for these changes, that was guessing on your part because you don't actually know, correct?

DR. KRANTZ: I do know that there are many other factors that come to bear when you're simply looking at an export graph or a graph of the amount of water they are delivering or taking versus what happens to that water.

MR. OSIAS: Could you put up the next graph, Mr. Hattam, please?

Just keep that pattern from Exhibit 11 in mind. And this is going to be IID Exhibit 70 which we will introduce in rebuttal.

First let me direct your attention to the scale on the Y axis. We see the acre-feet are measured up to a million six. Do you see that?

DR. KRANTZ: Yes, I do.

MR. OSIAS: On the other graph you were looking at it was over, well over, 3,000,000,000, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: This one is titled Total IID Inflow to the Salton Sea. And at least looking at the scale, the vertical

axis, the one-third relationship seems to be confirmed at least by the scale, correct?

DR. KRANTZ: Yes.

MR. OSIAS: You testified before that's about a third of the water?

DR. KRANTZ: That's right.

MR. OSIAS: You see the inflow is also volative, do you not, at least according to this graph?

DR. KRANTZ: Well, according to this graph, it is.

MR. OSIAS: Now, have you seen any graphs like this in the database repository?

DR. KRANTZ: No, I can't recall specifically seeing anything quite like this, no.

MR. OSIAS: Have you seen, if not in graphical form, in columns or tables or even text the amount of inflow that comes from IID annually to the Salton Sea?

DR. KRANTZ: No, I have not seen a graph that shows anything quite like this.

MR. OSIAS: Did you assume, therefore, that inflow from IID is fairly stable in doing your analysis of impacts to the Salton Sea?

DR. KRANTZ: We assumed that the inflow, given that the elevation has been stable, that the inflow has also been stable. That would be not only from IID, but from CVWD as well.

MR. OSIAS: If, in fact, you used an average over a period of time for inflow, say 40 years, then that average would, in fact, be a flat line even though the actual annual use fluctuated, correct?

DR. KRANTZ: I don't know.

MR. OSIAS: You don't know if the average would be a flat line?

DR. KRANTZ: Given something like this?

MR. OSIAS: Let me ask you a simple question.

Could you calculate an average for that chart?

DR. KRANTZ: Surely.

MR. OSIAS: Would it be a flat line horizontally if you calculated the average?

DR. KRANTZ: Like it -- yes, looks like it would be a flat line.

MR. OSIAS: And so if you used average inflows to do impact analysis, you would take out of the equation annual volatility, correct?

DR. KRANTZ: Yes.

MR. OSIAS: And isn't that, in fact, what you did?

DR. KRANTZ: That's right.

MR. OSIAS: Now if the Sea is sensitive to inflow adjustments, by using historical averages you take out of the equation those changes that the Sea would be sensitive to, correct?

DR. KRANTZ: Yes.

MR. OSIAS: Mark, could you put up the next graph?

Dr. Krantz, I believe you testified that you possibly knew more on the Salton Sea elevation than anyone; is that right?

DR. KRANTZ: Shoreline delineation, yes.

MR. OSIAS: Distinct from the elevation of the Sea?

DR. KRANTZ: That's right.

MR. OSIAS: I'm sorry.

You do know there are USGS gauges because you testified as to that, right?

DR. KRANTZ: Yes.

MR. OSIAS: You know that there is actually an IID gauge at a place called Fig Tree John.

DR. KRANTZ: I didn't.

MR. OSIAS: You didn't?

DR. KRANTZ: No.

MR. OSIAS: Were you aware whether the USGS gauge and the IID gauge produce exactly the same number?

DR. KRANTZ: No, I'm not aware of that.

MR. OSIAS: Even if they were calibrated slightly differently, wouldn't you assume that any changes as measured by each gauge would be roughly the same?

DR. KRANTZ: Yes. They should be measuring the same sea surface elevation.

MR. OSIAS: Thank you.

You mentioned in your testimony that there is annual fluctuation, correct?

DR. KRANTZ: Right.

MR. OSIAS: You will see on this graph, on the X axis, that it is calendar January to December. Do you see that?

DR. KRANTZ: Yes.

MR. OSIAS: This will be offered as 71 on rebuttal; I have handouts, I'm sorry. We can hand this around.

CHAIRMAN BAGGETT: That would be useful.

MR. OSIAS: You have them?

DR. KRANTZ: Yes, sir.

MR. OSIAS: Mark, maybe you could bring them up to the Board first.

Let's start with just the shape of the curves.

Dr. Krantz, the elevation during the year changes, typically reaching a peak in the April to June and a low in October to December; is that right?

DR. KRANTZ: That's true.

MR. OSIAS: Not just looking at the graph. From your own knowledge about the sea elevation, is that correct?

DR. KRANTZ: Yes.

MR. OSIAS: The graph actually shows the same thing?

DR. KRANTZ: That's correct.

MR. OSIAS: Now, if you see there is a different color

for the years '99 through 2002. Do you see that?

DR. KRANTZ: I do.

MR. OSIAS: 2002 being only a partial year because the last measurement was taken in May. Do you see that?

DR. KRANTZ: Yes.

MR. OSIAS: Isn't it true that between '99 and 2002, at least as reflected on this graph, the Sea has lowered a little bit each year?

DR. KRANTZ: It does appear that the numbers from one year to another are -- we are talking a tenth of a foot. I question the resolution of the data to really show a trend there.

MR. OSIAS: In fact, we didn't talk about the Y scale. We should do that.

The Y scale is in tenths of a foot, correct?

DR. KRANTZ: Yeah.

MR. OSIAS: Is a half a foot a meaningful difference in the Salton Sea?

DR. KRANTZ: It's of great biological meaning depending on what sorts of creatures can use what depths. But in terms of our own ability to determine those depths based on the best resolution imagery and other things we've got, a half a foot is beyond what we can really determine.

MR. OSIAS: When you say "we," who do you mean?

DR. KRANTZ: Salton Sea Database Program.

MR. OSIAS: At least with respect to Salton Sea database, we should at least add a plus or minus half a foot to all our elevation numbers?

DR. KRANTZ: This was based on imagery and gauging stations, these same stations, based on the dates that those photos were taken. This resulted in a shoreline delineation.

MR. OSIAS: I'm sorry, I'm not asking anything about shorelines, correct?

DR. KRANTZ: You are asking me to step out of the realm of what I can talk about knowledgeably.

MR. OSIAS: So if I ask you just about changes in height and not how that impacts the shoreline, you would have -- you don't have enough knowledge to talk about -- don't look at it the directly. I am just going to ask you a question.

Do you have enough knowledge about changes in elevation to discuss them with me?

DR. KRANTZ: Yes.

MR. OSIAS: So can a gauging station, based on your experience, detect a half a foot change?

DR. KRANTZ: Yes. A gauging station takes a static elevation at a given point.

MR. OSIAS: So if we were going to compare elevation at a gauging station from year to year, ignoring the shoreline

for a minute, just so we know the height of the Sea, could we measure a tenth of a foot?

DR. KRANTZ: Only by averaging everything out, yes.

MR. OSIAS: If we went to the gauging station, it is not calibrated for a tenth of a foot?

DR. KRANTZ: It is.

MR. OSIAS: He could take a reading and it would say that, correct?

DR. KRANTZ: Again, you're not understanding all the things that go into measuring the Sea surface elevation at a particular point on a gauging station. Wind fetch and other things that can pile up the water a little bit higher on one portion of the Sea than another. You can get opposing gauging stations that are perhaps a couple feet apart. But on average you can determine fairly precisely where it is.

MR. OSIAS: So you would collect appropriate data. And if you applied that data consistently from year to year, you would be able to detect a trend, correct?

DR. KRANTZ: Right.

MR. OSIAS: Whether it is actually accurate to a tenth of a point, the movement, either increasing elevation or decreasing elevation would be detectable?

DR. KRANTZ: Yes. This shows an annual cycle as you discussed.

MR. OSIAS: By the way, that is about a foot, right,

the annual cycle?

DR. KRANTZ: Right. It ranges from peaks around 226 down to troughs of 227.1.

MR. OSIAS: Actually 1.1 feet?

DR. KRANTZ: Yeah.

MR. OSIAS: We have enough information, using gauging stations and this other formula to know that, in fact, that Sea is not flat, it fluctuates in that range, correct?

DR. KRANTZ: On an annual cycle it fluctuates in that range, yes.

MR. OSIAS: So we should also be able to detect the differences between annual cycles with that same degree of precision if we are consistent in our methodology, correct?

DR. KRANTZ: It would appear so. I am puzzled by the fact that this data appears to be a foot or two higher than most of the other data that we have been looking at.

MR. OSIAS: In fact, it is -- if I told you it is exactly 11 inches higher than the USGS station, would that look about right?

DR. KRANTZ: I would look to see exactly where this station is in relation to the USGS station, try to understand that.

MR. OSIAS: But using one station rather than switching between stations, you should still be able to detect the changes at that station with the consistent methodology,

correct?

DR. KRANTZ: Yes.

MR. OSIAS: Thank you.

I take it from your scrutiny of this graph you didn't assume that the Sea has been going down for four years, correct?

DR. KRANTZ: No, I didn't assume that.

MR. OSIAS: If I told you it was also higher in 1998 than in 1999, would that surprise you?

DR. KRANTZ: Just subjectively it does seem to have dropped some over the past four years when I go out there today. There are areas that are exposed that I have not seen exposed.

MR. OSIAS: I do have copies of these. Let me show what will be IID 72. It is called A Strategic Plan for the University of Redlands Salton Sea Database Program.

Are you familiar with that document?

DR. KRANTZ: I am.

MR. OSIAS: In fact, you authored it probably, right?

DR. KRANTZ: Coauthored it with my staff, yes.

MR. OSIAS: Was that authored in '99?

DR. KRANTZ: Yes, it was.

MR. OSIAS: You now have it. If you will flip to Page 2 of this, you will see the description of the Database Program, and its purpose, correct?

DR. KRANTZ: Yes.

MR. OSIAS: And then if you flip to Page 3 -- I wish I found this before I asked questions last week -- this explains what the different committees are and who it is made up of, correct?

DR. KRANTZ: Yes.

MR. OSIAS: And then after that is a discussion of what the science committee does, correct?

DR. KRANTZ: Yes.

MR. OSIAS: You believe this is an accurate depiction of how the related entities work except for change, I suppose, between the subcommittee and advisory committee?

DR. KRANTZ: Doesn't indicate how they work. It indicates who it's comprised of, the members of these different boards.

MR. OSIAS: I'm sorry.

At least with respect to the Database Program and the science committee, it says what their mission is?

DR. KRANTZ: Yes. There is a description of the science -- well, no, that is -- yes, the Salton Sea Subcommittee.

MR. OSIAS: On Page 1 under the introduction you will see the third sentence says: However, during the past ten years, the Salton Sea has experienced a number of massive fish and bird die-offs as a result of a suite of pathogenic

and other contaminant problems.

That is an exact quote, correct?

DR. KRANTZ: That is an exact quote.

MR. OSIAS: And that is how you described the thriving fishery in this document?

DR. KRANTZ: At the time that was -- our mission was to understand those things. The actual studies on the fishery didn't -- weren't released until the year 2000, the following year.

MR. OSIAS: But it was true that during the ten years prior to '99 there had been a number of massive fish and bird die-offs?

DR. KRANTZ: Yes.

MR. OSIAS: That is an actual fact?

DR. KRANTZ: By massive -- yes, there had been a number of fish and bird die-offs.

MR. OSIAS: That is your word?

DR. KRANTZ: Yes.

MR. OSIAS: If we go down to the end of that paragraph, read with me where it says: At current rates of salt loading of 4,000,000 tons of salt per year, the Salton Sea will be unsuitable for fish and other wildlife in 15 years. The Salton Sea is facing ecological collapse.

That's also your words, correct?

DR. KRANTZ: Those were the words of our mission, yes.

MR. OSIAS: The 4,000,000 tons of salt is what you actually agreed with Mr. Kirk about when he was up here, correct?

DR. KRANTZ: That is true.

MR. OSIAS: With 4,000,000 tons of salt per year, you predicted a sea unsuitable for fish and other wildlife in 15 years, correct?

DR. KRANTZ: Learned a lot since then.

MR. OSIAS: That happens to match at least the low end of the range that you looked at from the Salton Sea Symposium document of January 2002, correct?

DR. KRANTZ: That did correspond with that other graph.

MR. OSIAS: That is a much more recent document, correct?

DR. KRANTZ: Yes.

MR. OSIAS: Are you familiar with an editorial -- this will be Salton Sea -- it is about the Salton Sea. This will be IID 73.

An editorial you wrote on September 9th, 2000?

DR. KRANTZ: I don't recall.

MR. OSIAS: That is after the work was done that you just alluded to, correct?

DR. KRANTZ: Yes.

MR. OSIAS: You have that in front of you?

DR. KRANTZ: Yes.

MR. OSIAS: If we go down to the bottom of that page, the bottom paragraph there under the bold Salton Sea you will see a sentence that reads: At the same time agricultural runoff is the cause of the massive fish kills and bird die-offs that the Sea experiences each summer.

Those are your words, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: So in 2000, after you had the year that you just alluded to in your answer, that was still your opinion, correct?

DR. KRANTZ: You've taken this out of context. There is a reason and it is not the salinity.

MR. OSIAS: I didn't suggest any reason, did I?

DR. KRANTZ: No.

MR. OSIAS: Thank you.

I'm just asking if this is what you published in the newspaper for the general public to read.

DR. KRANTZ: That's correct.

MR. OSIAS: If you turn to the next page, in September of 2000, the first sentence of the last paragraph you wrote: Much attention has been given to controlling rising salinity in the Sea, which will, indeed, be a problem in the next 15 years or so if nothing is done about it.

You see that phrase?

DR. KRANTZ: I do.

MR. OSIAS: That is not the full sentence, so I'll read the rest just to be fair: [verbatim], but the real threat to the Sea today is water supply.

That is how the sentence reads, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: In September 2000 you were still predicting a real problem in 15 years or so, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: So it was your opinion in '99 there was a 15-year period and in 2000 it had changed to 15 years or so, correct?

DR. KRANTZ: I believe that at that time we still had not received the final reports and, in fact, the salinity report which came out and discusses the salinity threshold was not completed until the end of that year or beginning of 2001.

MR. OSIAS: You're familiar with the Salton Sea National Wildlife Refuge webpage?

DR. KRANTZ: No.

MR. OSIAS: Let me show you that, the 1996.

CHAIRMAN BAGGETT: This is IID Exhibit?

MR. OSIAS: 74.

Do you have that in front of you now?

DR. KRANTZ: Yes.

MR. OSIAS: Have you ever been to this website? You

can see the address in the bottom left-hand corner.

DR. KRANTZ: No, I haven't.

MR. OSIAS: Did you know it existed?

DR. KRANTZ: No, I did not.

MR. OSIAS: This print off the Web is entitled Salton Sea National Wildlife Refuge, summary of 1996 avian botulism event.

Do you see that?

DR. KRANTZ: That is the title, yes.

MR. OSIAS: Were you aware there was an avian botulism event in 1996?

DR. KRANTZ: Not specifically, no.

MR. OSIAS: Dr. Hurlbert, you were aware of that, weren't you?

DR. HURLBERT: Yes.

MR. OSIAS: In fact, there was an avian botulism event in that year, correct?

DR. HURLBERT: Yes.

MR. OSIAS: Dr. Krantz, when you talk about a thriving fishery and whatever the avian equivalent of a fishery is, you didn't have in mind avian botulism, apparently, correct?

DR. KRANTZ: Simply looking at the numbers, the numbers are up by tens of thousands, when I'm talking about thriving bird populations.

MR. OSIAS: If we look to the bottom of the first page, you will see a sentence that reads: The most affected birds. At least according to the webpage of the U.S. Fish and Wildlife Service for the refuge that avian botulism --

MS. DOUGLAS: I'm sorry, where is the sentence?

MR. OSIAS: It starts, "The most affected birds." It is on Page 1.

MS. DOUGLAS: In which paragraph?

MR. OSIAS: Second from the bottom.

They report that the most affected birds were American white pelicans and brown pelicans, correct?

DR. KRANTZ: According to the report, yes.

MR. OSIAS: If we turn to Page 2, they start a discussion of the mortality roster by species as of November '96. Do you see that?

DR. KRANTZ: Yes, I do.

MR. OSIAS: Of course, it goes for a page and -- actually goes for almost the equivalent of two pages if you add the three together, right?

DR. KRANTZ: Yes, it does.

MR. OSIAS: That is sort of evidence of the number of species you were talking about, correct? Lots of bird species at the Sea?

DR. KRANTZ: These are the birds that are collected by National Wildlife Refuge personnel, that are obviously sick

or affected, yes.

MR. OSIAS: Mortality probably suggests they are dead; is that fair?

DR. KRANTZ: Yes.

MR. OSIAS: In fact, this botulism wasn't limited to the pelicans, correct?

DR. KRANTZ: No. It is widely, naturally occurring throughout the world in different circumstances.

MR. OSIAS: I meant at the Salton Sea it wasn't limited to those species?

DR. KRANTZ: No.

MR. OSIAS: If we get to the conclusion, you can see that 14,131 birds in that year, as of that date, died from just botulism, correct?

DR. KRANTZ: Yes.

MR. OSIAS: I assume that probably created an odor event, would you agree?

DR. KRANTZ: I don't know.

MR. OSIAS: Let me show you from that same webpage a summary of mortality events at the Salton Sea. And you see this one is entitled Wildlife Mortality Estimates 1987 to 1996.

CHAIRMAN BAGGETT: Exhibit?

MR. OSIAS: I'm sorry, Exhibit 75. I'm hurrying.

And I think if you look from '87 to '96 that there

isn't a year where there aren't mortality deaths from disease; is that correct?

DR. KRANTZ: That is true in almost any National Wildlife refuge.

MR. OSIAS: Thank you for that.

The diseases range from avian cholera to botulism to salmonellosis to unknown, correct.

DR. KRANTZ: That's correct?

MR. OSIAS: You didn't know this information was on the Web?

DR. KRANTZ: I am familiar with information like this from the National Wildlife Health Center that keep these statistics.

MR. OSIAS: Let me show you IID Exhibit, what will be, 76, which is an article from Science Magazine.

Inside is a blow up of one of the pictures that is in the article, just to make it easier to see. This says from an April '99 Science article, correct?

DR. KRANTZ: That is the date and it is the citation, yes.

MR. OSIAS: Do you put articles like this in your repository?

DR. KRANTZ: Yes.

MR. OSIAS: Do you know if this one is there?

DR. KRANTZ: I don't recall this one, no.

MR. OSIAS: It might be there, correct?

DR. KRANTZ: Yes. I am not familiar with all 5,000 citations.

MR. OSIAS: Science Magazine is a respected science magazine.

DR. KRANTZ: If it doesn't come to our attention, it can't be listed.

MR. OSIAS: I wasn't suggesting that you're purposely ignored this. Trying to get confirmation from the magazine.

DR. KRANTZ: Yes.

MR. OSIAS: If you look down to the second full paragraph, four lines down. Do you see where it starts after the comma, the Salton Sea is now a bird watchers winter paradise? You see that?

MS. DOUGLAS: Starting in the middle of the sentence, right?

MR. OSIAS: Yes.

DR. KRANTZ: Yes.

MR. OSIAS: In fact, at least that phrase is consistent with what your direct testimony is, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: And the next sentence which talks about it being a migratory pit stop for millions of birds is also consistent with your direct testimony?

DR. KRANTZ: That's correct.

MR. OSIAS: And then it says, lately, however, the Sea has become a death trap for the birds, too: Over 200,000 have succumbed to avian cholera, botulism and unknown causes since 1992.

It says that, correct?

DR. KRANTZ: It does say that.

MR. OSIAS: That is consistent with your '99 documents that talk about the massive die-offs, right?

DR. KRANTZ: Talking about a fraction of less than 1 percent of the birds there.

MR. OSIAS: And, therefore, we shouldn't be overly concerned with that?

DR. KRANTZ: Well, it is of concern. That is why the Salton Sea Restoration Project effort was commenced and Salton Sea Database Program was organized to try to pull that information together.

MR. OSIAS: I take it, then, that you would disagree with the last sentence of that paragraph, where Audubon Society is quoted as calling the Salton Sea an environmental Chernobyl?

DR. KRANTZ: They've misspelled Chernobyl.

MR. OSIAS: Yes, they did.

Other than that, do you disagree with the statement?

DR. KRANTZ: Yes, I would strongly disagree with that

statement.

MR. OSIAS: You testified about the history of the Salton Sea with respect to its periodic occurrences and disappearances, right?

DR. KRANTZ: Yes, sir.

MR. OSIAS: And that information is gleaned from a variety of sources which you discussed: carbon dating, bathtub rings, the mountains, cultural artifacts, correct?

DR. KRANTZ: That's correct.

MR. OSIAS: I suppose fossil record, maybe, things like that?

DR. KRANTZ: That's correct.

MR. OSIAS: Now, the Sea would disappear periodically totally, correct?

DR. KRANTZ: Occasionally, yes.

MR. OSIAS: And does the cultural record or the surveyors' letters or any of this other anecdotal information discuss the enormous dust clouds that followed the drying up of the Sea?

DR. KRANTZ: I don't recall any reference to dust clouds.

MR. OSIAS: In fact, there is no discussion of the airborne impacts of a historic Sea coming and going, correct?

DR. KRANTZ: During that time, there was no one there to experience the --

MR. OSIAS: Well, the people who were observing the Sea would have observed the kind of dust you see at Owens Lake, would they not have observed that?

DR. KRANTZ: If it happened on the days they were there.

MR. OSIAS: Do we have only a few days of evidence regarding even the existence of the Sea?

DR. KRANTZ: No. That existence is well substantiated by a number of different carbon dates and tree ring data and fossil pack rat middens and other evidence that is compiled from decades and hundreds of years.

Whereas the journey of a surveyor across the basin in 1849, he's there for a matter of a few weeks and then he's gone.

MR. OSIAS: So it is hard to know a whole lot from him about what has gone on in the Salton Basin?

DR. KRANTZ: Except he happened to be there during a flooding event.

CHAIRMAN BAGGETT: Mr. Osias, your time is more than expired. Do you have --

MR. OSIAS: I have one other topic that probably takes six minutes to explore.

CHAIRMAN BAGGETT: Okay.

MR. OSIAS: Thank you and appreciate your indulgence.

The flow reductions that you identified in your Exhibit

1 and which you amplified under the cross-examination by Mr.
2 Kirk, you recall that?
3 DR. KRANTZ: I do recall.
4 MR. OSIAS: If we take water out of the Sea, assume we
5 take 65,000 acre-feet of inflow away.
6 DR. KRANTZ: Yes.
7 MR. OSIAS: Whether that inflow reduction is from a
8 Mexicali sewage treatment plant or tailwater cut off,
9 setting quality issues aside, just in terms of elevation and
10 shoreline impact is the same, correct?
11 DR. KRANTZ: Yes.
12 MR. OSIAS: So the reason for the inflow reduction
13 doesn't affect where the shore ends?
14 DR. KRANTZ: In fact, we put our blinders on when we
15 talk about reducing inflow and try to simply analyze the
16 effects of those possible reductions, regardless of cause.
17 MR. OSIAS: If we lose 110,000 acre-feet out of the
18 Sea a year for salinity control, and we lost a hundred
19 thousand acre-feet because of the entitlement enforcement by
20 the Secretary of the Interior under the law, and we lost
21 65,000 from Mexico for the reason that you had in your
22 report, that would total 275,000 acre-feet of reduction,
23 correct?
24 DR. KRANTZ: It's a hypothetical chain of
25 possibilities.

MR. OSIAS: So I take it that that is a yes. Under that hypothetical you lose 275,000 of inflow?

DR. KRANTZ: But I don't agree that any one of those things is necessarily going to happen.

CHAIRMAN BAGGETT: That's what he asked. It would save us time if you just answer his question. It is not whether you agree under that hypothetical.

DR. KRANTZ: Under that hypothetical situation, if you add up 275,000 acre-feet of reductions for whatever cause, that is the reduced acreage.

CHAIRMAN BAGGETT: Thank you.

MR. OSIAS: And under that hypothetical, the impact of that inflow reduction would be close, not exact, it is a little less, but close to the 300,000 inflow rejection that you had on your map; is that right?

DR. KRANTZ: You are making some assumptions there on the 110,000 acre-feet. I think Mr. Kirk explained that.

MR. OSIAS: I'm going to interrupt you again, sir.

MR. FECKO: If, that's an important word and I understand. You understand what if means?

DR. KRANTZ: Yes, I do.

MR. OSIAS: So if 110,000 is removed for salinity control and if Mexico captures and keeps in Mexico 65,000 of inflow and if entitlement enforcement and the other things mentioned, like the IID/Metropolitan agreement reduce inflow

by a hundred, then would that 275,000 of inflow reduction approximate the same shoreline as the 300,000 of reduction that you showed us the map of?

DR. KRANTZ: If all those things happened, yes.

MR. OSIAS: How material is the 25,000? Is that a big difference or is 300- and 275- roughly the same?

DR. KRANTZ: Is that accumulative 25,000 or is that by itself? You mean 25,000 in addition to the 275-?

MR. OSIAS: No -- yes. I am trying to compare what you have a graph of, which is a 300,000 acre-feet a year reduction -- sources make no difference; you had your blinders on -- and a 275,000 acre-foot reduction, for the moment sources being ignored. How different will those pictures be is what I am asking?

DR. KRANTZ: They would look fairly the same.

MR. OSIAS: Okay.

Whatever compounds would be exposed in the soil would be exposed probably to the same degree for air quality purposes at 275- as at 3-?

DR. KRANTZ: I would defer to the sedimentologist.

MR. OSIAS: I thought I heard you testify as to air quality. Was I mistaken?

DR. KRANTZ: You're right.

MR. OSIAS: In your mind would they be roughly the same, 275- --

MS. DOUGLAS: Is the question about sediments or about acreage exposed?

MR. OSIAS: Acreage exposed exposing the sediments. In other words, the Sea declines roughly the same, I assume the air quality impact is roughly the same.

DR. KRANTZ: It's going to expose whatever is in the sediments.

MR. OSIAS: Thank you.

CHAIRMAN BAGGETT: Thank you.

I have two or three questions, and then staff's got a few.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY THE BOARD

CHAIRMAN BAGGETT: Mr. Vogl, since you haven't had a question for a while, just have one.

You referred to arsenic and lead levels, that the potential as you expose the lakebed, you increase arsenic and lead levels. As I recall, you stated they would be above EPA's, I assume you meant federal EPA, current air quality standards?

MR. VOGL: It was -- I believe it was Region 9's ambient air quality for arsenic.

CHAIRMAN BAGGETT: How does that compare -- have you looked at it compared to the California Clean Air Act?

MR. VOGL: No, I haven't. I just compared to that one number.

CHAIRMAN BAGGETT: See whether our numbers were more stringent or less stringent. Okay.

Dr. Hurlbert, do you know what the mortality rate of birds is in Mono Lake? We heard some evidence it was -- there was a mortality rate in Salton Sea. I assume there is a baseline mortality rate for birds in a saline ecosystem.

Do you have any idea what it is for Mono Lake?

DR. HURLBERT: Not really. Mortality rates vary tremendously in natural systems and artificial systems. Orders of magnitude differ from one year to another, as a result of differences in weather differences and development of organisms in the parasites, for example, in the system.

So in Mono Lake there is mortality due to fox predation, coyote predation on nests, for example.

CHAIRMAN BAGGETT: Per our order. I understand.

DR. HURLBERT: It is hard to compare the systems. There is -- there have never been, to my knowledge, mortalities associated with disease of the sort we find at the Salton Sea. That would be correlated with the fact it is a much less nutrient rich system.

CHAIRMAN BAGGETT: That is what I am trying to understand. If there are studies -- I understand there is a difference in saline lakes and the ecosystems of those lakes

depending on whether it was in the former Soviet Union in Russia or in the Great Salt Lake or Mono Lake or Searles Lake. They all have their own unique characters. But there are no mortality studies, to your knowledge, comparing different types of lakes and bird populations in different kinds of saline environments?

DR. HURLBERT: For a large number of years there were a couple of ornithologists doing very detailed studies on bird populations at Mono Lake. So there is data on -- the data is more focused on nesting success than mortality. Because you simply don't have these mass mortality of adult birds that frequently.

CHAIRMAN BAGGETT: So the Salton Sea -- so there is really no way to compare the Salton Sea to other saline-type ecosystems in terms of mortality rates of avian population?

DR. HURLBERT: Not really. One thing to keep in mind is if you've got a million birds on a lake and you've got a 5-percent mortality, you have 50,000 dead birds on the shoreline. So it can be very spectacular, but still a very small percentage of what is there at the moment.

CHAIRMAN BAGGETT: Do you have any idea of what the fluctuation of the mortality rate of Salton Sea bird population is over the last 50 years? Is it 1 percent a year average, or 5 percent? Does it go between one and ten? Any studies along those lines?

DR. HURLBERT: It's only been roughly estimated for a couple of these large conspicuous birds, like the pelicans. They have been keeping track of those. They are easy to count.

CHAIRMAN BAGGETT: What percent? Do you have any idea? Catastrophic event is 5 percent of the population? 10 percent? 20 percent? Do you have any idea?

DR. HURLBERT: There were some estimates made in '96 when they had roughly 14,000 pelicans die. I recall seeing estimates that that was a significant fraction of the North American population. I forget. The people in the room will probably remember better than I do.

CHAIRMAN BAGGETT: Dr. Krantz, do you?

DR. KRANTZ: Most of these -- just looking at these numbers here, most of them are probably far and away less than a tenth of a percent of those populations by the total numbers of those birds that are here.

CHAIRMAN BAGGETT: Even in a catastrophic year, still only be --

DR. KRANTZ: With the potential exception of this white pelican event which was a real eye-opener to the ornithological --

CHAIRMAN BAGGETT: Generally you are looking at 1 percent or less, even in a catastrophic --

DR. KRANTZ: Yes. The eared grebes event in 1992 was

also an order of magnitude above these low levels.

CHAIRMAN BAGGETT: I guess to follow up, you testified that the bird populations have actually increased over the past years. Can you elaborate? Is that a certain species or all species or --

DR. KRANTZ: Based on Christmas bird count data taken at both ends of the season, since 1969, the fish eating bird populations have gone up from less than a thousand on all previous counts prior to 1980 to greater than 15-, 20,000 in every year in the 1990s. That seems like a pretty significant increase. Plus overall species diversity has trended consistently upwards.

CHAIRMAN BAGGETT: Thank you. That is all the questions I have.

MR. FECKO: I will start.

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CROSS-EXAMINATION OF PLANNING AND CONSERVATION LEAGUE

BY STAFF

MR. FECKO: Good afternoon, Mr. Vogl. And my questions are going to be to Mr. Vogl, but if anybody else wants to, please.

I am trying to understand how some of the sediments move in the Sea. And actually you're the best person to ask about this.

You testified that you have been doing sediment

sampling at the Sea at different points through core samples around the Sea; is that right?

MR. VOGL: Correct.

MR. FECKO: Do sediments in the Sea tend to shift within the Sea or once they are deposited do they tend to stay materially static?

MR. VOGL: I think some of the shallower sediments may shift around, especially the ones that are within the upper foot or upper few inches, may be redistributed during periods of wind where it churns up the water, especially in the shallows. It could be redistributed throughout the Sea. The deeper sediments, once they're placed, they are fairly static, unless it was eroded later.

MR. FECKO: Do you have an idea of how fast those sediments accrue in the Sea, what the source of that accrual is?

MR. VOGL: I am not that familiar with the rates. But I remember looking at them when we did the study, and they were not extremely high sedimentation rates. But it is mainly from the inflows of the Alamo and the New Rivers, and they're chocolate brown in color, so they are carrying -- so sediment load is being carried into there.

MR. FECKO: We heard a lot of testimony about PM-10 emissive rates around the valley, the fact that they are nonattainment. Is that a significant source of these

sediments that are in the Sea?

MR. VOGL: Could you restate that?

MR. FECKO: Are windborne sediments a significant source of sediments in the Sea?

MR. VOGL: Any windborne sediment that would land on the Sea body itself would fall down and be part of the sediment that is being measured in there. It also would be picked up and carried through any runoff that is coming into the Sea.

There is sort of a sediment cycle where it would be redistributed and then it would kind of come back in the Salton Sea being the final sink where it is deposited at the end.

MR. FECKO: I guess significant is a hard word to define. I don't have a measure of what significant is. Would you say it was substantially less than what comes in from the river inflow, then?

MR. VOGL: I would suspect so.

MR. FECKO: Is it fairly difficult to pinpoint the -- the charts you had of the contaminants, metal and otherwise, is it hard to pinpoint whether that comes from inflow or windborne particles?

MR. VOGL: Yeah. We just looked at the total sediment and analyzed it. So it is hard to say what the actual source or where that sediment we're measuring originated.

You could see some of the distribution patterns near, like, the Whitewater inflow that appeared to be associated with water and sediment inflowing in that area.

MR. FECKO: Now I imagine similar to other systems, the deeper you go in the sediment core, the older -- the longer those sediments have been there; is that right?

MR. VOGL: Correct.

MR. FECKO: How deep did you go?

MR. VOGL: Six feet.

MR. FECKO: At the bottom of those cores, did you find less contaminants as you went deeper into the core?

MR. VOGL: In general, the top foot of sediment was the highest concentrations of the metals and selenium, metalloids.

MR. FECKO: I guess since we are talking about selenium, let's discuss it.

Did you analyze the forms of selenium that were found in the sediments? Is it elemental? Is it selenate?

MR. VOGL: We didn't differentiate; it was just total selenium.

MR. FECKO: Has there been any sediment sampling done on the land around the Sea?

MR. VOGL: Yes, there has.

MR. FECKO: On the shorelines?

MR. VOGL: Mainly in the drains leading into the Sea

there has been quite a bit of stapling done.

MR. FECKO: What about the drier acres, the upland areas around the Sea?

MR. VOGL: There has been some on the Naval test base, that I am aware of.

MR. FECKO: Are you aware of those results? Do you know what they found?

MR. VOGL: No, I can't recall.

MR. FECKO: You mentioned hexavalent chromium. Was that found in the Sea?

MR. VOGL: No. We only analyzed for total chrom, so we didn't differentiate between trivalent and hexavalent chromium.

MR. FECKO: Couple for Mr. Krantz. Sorry, Dr. Krantz.

Do you have any ideas or have you done any studies regarding how the newly exposed Sea bottom would act if, in fact, there was Sea bottom that is now under water exposed, would the sediment act in a fashion that they have acted in the past, like underneath Lake Cahuilla, in other words?

DR. KRANTZ: The Database Program has not conducted any analyses of how those sediments would act. I have participated in the air quality technical committee deliberations that began April 3rd. And a white paper will be forthcoming pretty shortly in the next few weeks with the results, the findings of that committee. I can speak to you

about some of the concerns of that committee.

MR. FECKO: Probably let that come out in time. I would rather not speculate on that.

One of the physical geography questions I have. Is there any other formations like Mullet Island in the Sea, that is anywhere in the Sea, currently that is under water that could potentially be exposed?

DR. KRANTZ: No, there aren't. No other significant outcrops or anything that would become an island once it is drawn down.

MR. FECKO: How was Mullet Island formed?

DR. KRANTZ: Mullet Island is the remnants of a cinder cone of volcanic origin.

MR. FECKO: Thank you.

Dr. Hurlbert, let's talk about the fish of the Sea for a couple minutes.

What is the main forage fish of the psicivorous birds in the Sea? Can you generalize in that fashion?

DR. HURLBERT: It would be different for each species. You've got fish eating birds ranging from little tiny terns which are picking up probably only baby fish perhaps of several species and can't handle larger fish to the white pelican which is the biggest of the fish eaters and the great blue heron which can handle two- or three-pound tilapia without a problem.

So, the fish species are different size adults. They all go through juvenile stages, so the overlap of diets is partly size-related and partly species-related.

MR. FECKO: Let's focus on tilapia for a minute. What is the generation time of tilapia, in other words?

DR. HURLBERT: They appear to be -- in this time of the year it seems like they are able to reproduce before winter comes. They can become reproductively mature in the matter of a few months.

MR. FECKO: So, I guess, we've heard testimony that they were introduced sometime in the early '60s; is that right?

DR. HURLBERT: Yeah, mid '60s.

MR. FECKO: So we've had perhaps a hundred generations?

DR. HURLBERT: Well, I am trying to remember whether they could -- some of them could reproduce the same year they're hatched or others born later in the season probably wouldn't reproduce till the following year. I don't recall offhand whether they will reproduce more than once a year, but at least 40 generations.

MR. FECKO: So upwards of 40 generations. Do you feel that with the unique chemistry of the Sea that every generation is making some adaptations to better survive in the Sea, better reproduce in the Sea? And do you feel that 40 to whatever number of generations upwards of 40 is a

sufficient number of generations for them to make significant genetic moves to allow themselves to live in the Sea in a more efficient fashion?

DR. HURLBERT: That is a good question. That question came up a lot during the Mono Lake hearings. Because people were arguing that. Well, if the salinity increases, organisms can evolve; they will just become more resistant to the higher salinities and figure out a way to get around that. But it is very -- on the one hand it is highly likely that there have been slight genetic changes in the fish since they got into the Sea, simply because the selective forces are so different from the selective forces in the environments, of the natural environments they came from.

On the other hand, it is very likely that there are not any documented cases I know of where those genetic changes can accomplish a large degree of adaptation to the new circumstances. It is quite different from situations that we are often thinking about in the case of the genetic development of resistance to pesticides, which a lot of bugs and other organisms have developed. Basically all they have to do there is just develop an enzyme, a new enzyme that digests the pesticide.

But in the case of salinity, it is a very fundamental thing. You can't develop an enzyme that is going to simply get rid of the salt. And usually organisms adapt to those

sorts of things by putting more energy into, say, osmoregulation, salt regulation, water regulation in their bodies at the expense of their own growth rate, or at the expense of the number of eggs or young they produce.

So I think that is not something that is going to be of any help for any of those species when we're talking about increases of 10, 20, 30 grams per liter salinity.

MR. FECKO: Could that be what is partially responsible for some of these species largely outliving the predictions that were made for them? In other words, the studies that have been done on some of these species show a salt loading or salt load that they can take which has already been exceeded in the Sea.

DR. HURLBERT: That could account for a little bit of that. But, number one, there are actually been very few good studies done on salinity tolerance, and often they are short-term studies done in the laboratory that look at how high a salinity can fish tolerate over a couple weeks. And they don't look at effects of salinity on the whole life cycle which is what really determines whether the fish will be able to survive.

MR. FECKO: In that vein, then, are all the fish in the Sea reproducing in a health manner at this point or have you seen differences in age class? Has the recruitment gone down in the last ten years, let's say?

DR. HURLBERT: It's difficult to say. The marine fish seem to have individuals from most of the past -- if you look at the population right now, you'll find individuals representing the reproduction of each of the several past years. You can age the fish out there.

The tilapia is reproducing more erratically. So whether that is salinity or something else is a question. But they are not successfully producing a batch of one-year-olds every year. We see them producing the babies, but those babies often aren't surviving the winter.

MR. FECKO: Can you generalize as to where the majority of the fish are located that we see? Are they in open water? Are they found mostly in the delta area by species?

DR. HURLBERT: They are pretty much all of them all over. The sargo is scarce enough that we don't really have much good information on it. The main -- the most -- the biggest picture aspect of the distribution is that during the summertime, when they have these periods of inoxia or lack of oxygen in the surface waters of the lake, the fish, most of all the fish and all the species seem to move to the near shore areas for the summertime where oxygen conditions are better.

MR. FECKO: You had testified as to the health warnings issued, I believe it was the Department of Health Services; is that right? We heard testimony during a phase

of the hearing regarding -- do you know when that was issued?

DR. HURLBERT: Is the selenium advisory?

MR. FECKO: That is what I am asking.

DR. HURLBERT: That was in 1986. I think it was the State Department of Health.

MR. FECKO: Is that still, that advisory --

DR. HURLBERT: That hasn't changed.

MR. FECKO: That's it.

Thank you.

MR. PELTIER: Good afternoon.

Mr. Vogl, earlier today you put on some distribution maps for some metals and metalloids. And then you discussed some arsenic and lead. I didn't see any distribution maps for those.

Did you try to make maps or just didn't show them?

MR. VOGL: I never made maps of those constituents.

MR. PELTIER: Is there a reason? Were there not enough data to do that?

MR. VOGL: There was only one really elevated lead hit. So it wasn't really worthy of doing a whole map, and they weren't identified at the time as being the main constituent for chemicals of concern. So they weren't presented in a figure format. There is -- all the tables and data are in the report.

MR. PELTIER: I haven't had a chance to look at your report. Is the same for arsenic? Did you only have one hit for arsenic?

MR. VOGL: No. Arsenic was pretty prevalent. There was lower concentrations, below ten milligrams per kilogram detected in quite a few samples.

MR. PELTIER: Can you give me just a ballpark percentage of the samples you took that had arsenic in them?

MR. VOGL: I don't recall.

MR. PELTIER: Not, like, half?

MR. VOGL: I could quickly look at the report.

MR. PELTIER: I would like to know.

MR. VOGL: Looks like just about every sample had detected arsenic concentration.

CHAIRMAN BAGGETT: What exhibit, for the record?

MR. VOGL: It is Table 4 of --

MS. DOUGLAS: It is PCL Exhibit 20.

MR. VOGL: It doesn't have page numbers. Actually Table 4.

MR. PELTIER: I am trying to get an idea what you based that conclusion that the dust generated --

MR. VOGL: I actually went through quickly and took the arsenic concentrations that were detected and averaged the concentration and then assumed the PM-10 value of a hundred -- get the exact number.

Well, basically that the PM-10 standard would exceed 150 micrograms per cubic meter. So assuming that it was exceeded using an average concentration for the arsenic values in the sediment, it would result in exceedance of the ambient arsenic concentration from Region 9.

MR. PELTIER: Thank you.

I have a few more questions for Dr. Krantz. You have been resting for a while.

On Page 11 of your Exhibit 1 there is a statement at the bottom of the page that cost estimates for solar evaporation ponds increased from 500,000,000 to 1.5 billion. Salinity could be maintained. I am just wondering does that -- do you have any feeling about whether the salinity control would be feasible at that $1.5 billion cost?

DR. KRANTZ: I would defer to Mr. Kirk about that. But my understanding is that the footprint of the operation expands so greatly that it would be questionably feasible, physically capable of keeping up with the salt load.

MR. PELTIER: Because of cost or salt?

DR. KRANTZ: Because the salt is simply going exponential at that point.

MR. PELTIER: Do you know how many square miles of ponds it takes to remove the, like -- I think you had 4,000,000 tons of salt was what you were targeting for

removal?

DR. KRANTZ: I would defer to the Salton Sea Authority again as to the details of how much acreage would be needed for accommodating just the stabilization of the salt level. My understanding is that it is on the order of 20 or 30 square miles.

MR. PELTIER: Twenty or 30 square miles.

I have a -- I was looking at this Salton Sea Authority Exhibit 11. And on Page 17 of the exhibit there is a graph that compares the cost of in-sea and on-land pond systems. I was trying to determine when you made the statement in here about the 500,000,000 to 1.5 billion, was that for in-sea or on-land ponds, the 500,000,000 number?

DR. KRANTZ: In-sea ponds was 500,000,000 comprising around 20 square miles, if I'm reading this correctly.

CHAIRMAN BAGGETT: The question was: Was that what you relied on in the graph in your brochure?

DR. KRANTZ: Yes.

CHAIRMAN BAGGETT: That was the question.

Thank you.

MR. PELTIER: You're saying the $500,000,000 number was based on in-sea ponds, but when you first testified it wasn't until Mr. Kirk cross-examined you that you came up with the -- I am trying to understand why the difference between originally the need to remove, I think, 110,000

acre-feet.

DR. KRANTZ: You're exporting it into the ponds. If it is in-sea ponds, then it is displacing the water.

MR. PELTIER: I understand that.

DR. KRANTZ: So it is not an actual reduction of inflow.

MR. PELTIER: But when you first testified you were talking about Page 11, I believe Page 11.

DR. KRANTZ: Those are potential salinity control measures. And we took the round number of 110,000 acre-feet as the amount of seawater containing a million tons of salt.

MR. PELTIER: Thank you.

DR. KRANTZ: I understand that Mr. Kirk differs with my arithmetic a little.

MR. PELTIER: That is all.

CHAIRMAN BAGGETT: If not, I guess before we take a break, you have redirect?

MS. DOUGLAS: I would like to have a quick conference to decide whether we will have redirect.

Can I take --

CHAIRMAN BAGGETT: Let's take ten minutes and we'll come back.

MR. FLETCHER: Can I just bring up a scheduling matter. How long do we expect to go tonight?

CHAIRMAN BAGGETT: I wanted to get through your other panel today.

MR. FLETCHER: I hoped to as well for a very practical reason, which is that two of my witnesses, Mr. Tom Raftican and Bill Karr can only be here this afternoon. I made an error in time judgment here.

CHAIRMAN BAGGETT: That will depend on redirect, I guess. So let's take ten minutes and come back. If we do redirect, there is -- depends on the redirect. We'll decide when we come back.

(Break taken.)

CHAIRMAN BAGGETT: On the record.

MS. DOUGLAS: I would like to put all of my exhibits in the record, all of PCL's except for two. I have two exhibits pertaining to a witness who is not going to be available, and so I am just looking at my exhibit list so I can say which two they are.

CHAIRMAN BAGGETT: If there is no objection you can.

MR. OSIAS: We would object.

MR. HATTAM: We discussed this with counsel.

MS. DOUGLAS: I've already had a discussion about this and I understand I would have an objection if I tried to put those two exhibits into the record.

CHAIRMAN BAGGETT: Let me know which exhibits.

MR. OSIAS: It is Mr. Horvitz's testimony.

MR. PELTIER: 26 and 26A.

CHAIRMAN BAGGETT: 26 and 26A, does that sound right?

MS. DOUGLAS: It is Mr. Horvitz's testimony and Mr. Horvitz's Power Point. Those are the two exceptions, with the exception of 26 and 26A.

CHAIRMAN BAGGETT: Is there any objection?

If not, they are entered into evidence.

Thank you.

Are you ready, Mr. Fletcher? Have your next panel?

MR. FLETCHER: Is there any redirect?

MS. DOUGLAS: No.

CHAIRMAN BAGGETT: There is no redirect, so we will continue with the next panel. While you're setting up, let me make a couple housekeeping --

Off the record.

(Discussion held off the record.)

CHAIRMAN BAGGETT: Back on the record.

Continue with Defenders of Wildlife case in chief.

MR. FLETCHER: Just to begin opening comment, I have three witnesses: Mr. Bill Karr, Mr. Tom Raftican. They both will testify as to recreational fishing. I have Mr. Theodore Schade from Great Basin Air Pollution Control District who will testify as to air quality impacts.

In view of the hour and the fact that Mr. Karr and Mr. Raftican cannot be here tomorrow, I would prefer to have

those two testify as a panel and put on Mr. Schade tomorrow. Unless somebody thinks that we can get through all three of these folks this afternoon, I suspect that is not the case.

MR. OSIAS: Why don't we try and do the two fishermen as a panel, do the cross on them and --

CHAIRMAN BAGGETT: That is what he is proposing, right?

MR. FLETCHER: That is exactly right. If we have time, that is great. Because Mr. Schade can be here tomorrow.

CHAIRMAN BAGGETT: Let me swear the three witnesses in at the same time.

(Oath administered by Chairman Baggett.)

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DIRECT EXAMINATION OF DEFENDERS OF WILDLIFE

BY MR. FLETCHER

MR. FLETCHER: Mr. Karr, I will start with you.

Can you tell us -- you're an outdoor writer?

MR. KARR: That's correct.

MR. FLETCHER: Can you identify yourself for the record and tell us about your experience as an outdoor writer?

MR. KARR: I'm the editor for the Northern California edition of Western Outdoor News, a circulation of 70,000 paid subscribers in the state. Also, associate editor for our magazine, our sister publication, Western Outdoors Magazine, a hundred thousand circulation on the West Coast.

My writing experiences go back to longer than I can almost remember. I've been writing for about 20, 25 years now, and I have published nationally and internationally.

MR. FLETCHER: Do you recognize that binder that -- the document that is in that binder before you labeled Defenders of Wildlife Exhibit 9.

MR. KARR: Yes, I do.

MR. FLETCHER: What is that document?

MR. KARR: That is my testimony and exhibits.

MR. FLETCHER: Are there any -- actually, Exhibit 9 is just your testimony?

Are there any changes or corrections you would like to make to your testimony at this time

MR. KARR: No, it is fine.

MR. FLETCHER: What is the circulation of the magazine? You mentioned it.

MR. KARR: Western Outdoor News is approximately 70,000 paid subscribers and the magazine a hundred thousand.

MR. FLETCHER: And you have fished and written extensively about fishing in California?

MR. KARR: That is very definitely.

MR. FLETCHER: Can you tell us about your earliest experiences fishing at the Salton Sea?

MR. KARR: We moved there in 1959. And I went to Palm

Springs High School, and that is where we did almost all of our fishing and hunting, was at the Salton Sea. It was our closest playground. My grandfather was a Methodist minister in Westmoreland, and I learned to hunt and to fish from him at the Salton Sea, as a matter of fact. We would go there on weekends and sometimes at night, fishing after school, actually. Quite phenomenal fishing.

MR. FLETCHER: In the 1980s you wrote a book about the Salton Sea which is Defenders' Exhibit No. 10?

MR. KARR: Correct.

MR. FLETCHER: Why did you choose to write about fishing at Salton Sea?

MR. KARR: It was growing by leaps and bounds, the numbers of people that went there, and it was certainly an avenue that needed to be explored as far as how to fish the various species at the Salton Sea, where could you go to catch the different species, the baits, the lures, everything else. And I think somewhere back behind there I had the dream that I might make some money.

MR. FLETCHER: When I was reading your book and looking through it, I noticed it has a number of ads from a variety of businesses: marinas, fishing supply shops. Actually, you can describe some of the ads.

MR. KARR: Yeah. There's been a lot of different areas around the Salton Sea that were and some that still are,

trailer parks and marinas and people that provide bait and tackle and things like that. There is some old standbys. Some of them have been bought, of course, and put out of business, so that they wouldn't have claims, I think, against rising and lowering water levels. But other than that, things are still pretty much the same as they have been for a long time.

MR. FLETCHER: There are guides, charter boats, supply shops, facilities for recreational fishermen in the vicinity of the Sea?

MR. KARR: Very definitely. And some of the surrounding cities are dependent on the tourism and the hotels and meals, and things like that.

MR. FLETCHER: Let's turn to the fishing at the Sea. Can you describe the quality of the fishing at the Sea?

MR. KARR: Excellent, always has been. As a matter of fact, Tom could probably take over there. He was there yesterday.

MR. RAFTICAN: It is very good.

MR. FLETCHER: I can ask Tom later.

MR. KARR: You bet. Well, I got a report the last month it has been phenomenal for corvina. They are catching them with almost everything and getting fish from six to 15 points off the north shore state park, and pretty much around the whole Salton Sea. It usually starts in the

south end and then seems to get better and better as you get up towards the north end.

MR. FLETCHER: Can you fish productively from the shore of the Sea or do you need a boat?

MR. KARR: The shore is sometimes much better than by boat, as a matter of fact, and it has been for the last month. People have done much better on the shore than by boat.

It's one of the few places in California where the average Joe can just pull up a car alongside the Salton Sea and throw out almost anything and catch something.

MR. FLETCHER: What makes it so -- what makes the fishing so good there in terms of the experience?

MR. KARR: Sheer numbers of fish. The fact that they're all good eating fish. Nice white fillets and good eating and quite readily take to bait and lures. You can catch a lot quite easily. There is no limits on any except for the corvina. So people who really want to fill their freezer can do that.

MR. FLETCHER: What are the sport fish at the Sea?

MR. KARR: The large mouth corvina, of course, gets up to 36 and a half pounds. I believe that is the record down there at the Sea. They usually average between five pounds and 15 pounds, I would say, the corvina.

We have the tilapia, of course, that was initially

introduced into the irrigation ditches to control weeds, little knowing that they could survive the saltwater, too -- they made their way. Both the tilapia mossambic and the tilapia zillii are found there. One is a mouth breeder and one is a nose breeder. They now can be found throughout the Salton Sea, also. Quite susceptible to cold temperatures. If the water gets very cold, then they die off, also.

The croaker or bairdiella croaker are a big schooling fish, as are the corvina. They seldom get over three pounds, also very good eating, and will eat almost anything that gets in front of them. Of course, we have the sargo. And a friend of mine was trying to do a survey for someone back about ten years ago, and they couldn't -- we used to catch sargo a lot off the structure areas. Then they seemed to disappear, and now they are making another come back. We are finding quite a few sargo almost anyplace that there is rock habitat or the sunken buildings or at the target.

MR. FLETCHER: How about tilapia, how are they?

MR. KARR: Tilapia, how are they what?

MR. FLETCHER: Did you go over tilapia? I guess you did.

MR. KARR: Yeah. Tremendously prolific fish. Absolutely gorgeous. If you get a big spiny male tilapia mossambic, that are almost black in color with bright red fins, absolutely beautiful fish.

MR. FLETCHER: What are the seasons for fishing at the Sea? Are they great in summer, bad in the winter? How does it work?

MR. KARR: Generally the same as the Sea of Cortez. The hotter it is, the hotter the fishing. It gets a little better as it gets hotter. It starts around March, April, depending on the weather. It gets better and better until it starts getting cold in the fall, although you can find fish year-round. I did a specific story, fishing in the south end of the Salton Sea, in our magazine, and we were out in February. And we were catching good numbers of corvina down in the south end where the geothermal activity is. It keeps the water warmer, I think.

MR. FLETCHER: In your experience how is fishing at the Sea for families? Is that as an expert fishery or --

MR. KARR: No. It is definitely -- it can be an expert fishery depending on how much finesse you want to use or what type of tackle. But the Salton Sea is the best place I've ever gone fishing for families or have ever seen for families.

I've been down there on weekend days when there is 200 people lined up along one of the canals going into the Salton Sea catching tilapia. Down there along some of the state park areas people are either in motor homes, they'll be swimming and catching fish off of inner tubes, people

playing in the water and water skiing, hundreds and hundreds and hundreds of people up and down the beach. It is underutilized and phenomenally fun and great family stuff.

MR. FLETCHER: Actually you said that on some days -- you just mentioned on some days you see hundreds of families lined up. What are some of the -- describe to me geographically in terms of the Sea where are the hot spots?

MR. KARR: Where people fish, anyplace that you can get to the Salton Sea. All of the state park covers mostly the north shore of it, down towards Niland and Calipatria -- Niland. That is part of the beauty about it. Anyplace that you get to the Salton Sea you can catch fish. The south end is really good, down by Red Hill Marina, Black Rock, Obsidian Buttes, any of those roads that go along the Salton Sea there, you can stop almost anywhere and throw the lures and catch corvina and catch sargo, catch tilapia.

Certainly where the rivers come in are good places. Where the canals come in are good places. What I have said in my book many times, if you don't catch a fish in about 15 minutes, jump in your car and go somewhere else and you will find them.

MR. FLETCHER: If this fishery declines and disappears, where could anglers go in California for an experience comparable?

MR. KARR: Maybe the ocean, except the heavy

restrictions on getting down to the beach and stuff like that, and they wouldn't catch as many fish. The Salton Sea can't be beat for the fishing in California and possibly the world as far as how many fish per hour you can catch. That's been substantiated in many California Department of Fish and Game reports over the years. They haven't done any studies recently, but from personal experience, what I've seen and considering that is what I do for a living, I still know you can catch more fish at the Salton Sea than anywhere else in the state. And I know of no other recreation area that can handle 400,000 visitor days.

MR. FLETCHER: Basically nowhere in Southern California, at least, can take the place of the Salton Sea.

MR. KARR: Any of California, as far as quality of fishing or handling that number of people.

MR. FLETCHER: How about the Colorado River?

MR. KARR: Colorado River is a lot of fun. A lot of it is private property. Again, you have Indian reservations and some restrictions. You have a lot of refuges down there. There's pretty good fishing there. I fished myself. You can get blue gill, or cropie, bass on occasion, some of those big nasty looking catfish that live down there. But, again, not to the numbers that the Salton Sea can produce fish.

MR. FLETCHER: Reservoirs in Southern California, how

are those?

MR. KARR: None comparable.

MR. FLETCHER: Why not?

MR. KARR: Primarily I would say, again, it's the vast number of fish in the Salton Sea. It is such a nutrient rich resource and so full of fish that -- that is all there is to it. There is so many fish, that you can catch lots of fish, different varieties and species.

MR. FLETCHER: So is the Salton Sea a unique resource?

MR. KARR: Very definitely, in many, many respects.

MR. FLETCHER: Could you elaborate on a few?

MR. KARR: Sure. It gives you a certain feeling. The saltwaters itself is stimulating I find when I'm swimming in the Salton Sea, the buoyancy is nice. Fishing is -- it can be a lonely experience. If you go there during the week there might not be another person around for two or three miles, which can be kind of nice to get away from it and see that.

Being on it in a boat is fascinating, the different colors of the water. You can find a red tide. Sometimes I have seen the Salton Sea when it is so clear you can see four feet through it, just phenomenal, amazing. The bird life. Some of the rookeries at the south end of the Salton Sea when you're fishing down there in the trees and the cormorants and pelicans are -- not the cormorants, and the

great blue herons and stuff are hatching out the babies and stuff down there. Absolutely fascinating. Sounds like a jungle movie.

MR. FLETCHER: Well, I actually have no more questions for you.

Thank you.

MR. KARR: Certainly.

MR. FLETCHER: I will move on to you, Mr. Raftican.

Now, Mr. Raftican, can you identify yourself for the record and describe your position and your background?

MR. RAFTICAN: My name is Tom Raftican. I am president of United Anglers of Southern California, and I have been a recreational fisherman for nearly a half a century. And there is no formal training for that or for being president of United Anglers. That is the good news or the bad news.

I have worked in marine conservation efforts since the mid '80s and fishery efforts where I work with kids, kids fishing tournaments and local fishing tournaments. I've produced and hosted over 200 television programs dedicated to fishing, boating, diving. And I currently have been president of United Anglers of Southern California for five years, and I serve on a number of state panels that work with recreational anglers as far as fisheries in the State of California.

MR. FLETCHER: Actually, could you name a couple of

those. MR. RAFTICAN: The Ocean Resources Enhancement Hatchery Panel, the Director's Marine Advisory Panel for the Director of the Department of Fish and Game. Currently I am on the ad hoc committee for marine protected areas in the state of California. I think that is probably the ones I'm on right now.

MR. FLETCHER: Just wanted a couple examples.

Do you recognize the document -- I would like to have you open your binder open. The document before you labeled Defenders Exhibit 14?

MR. RAFTICAN: Yes. Fourteen is my testimony.

MR. FLETCHER: Are there any changes or corrections you would like to make to your testimony?

MR. RAFTICAN: Actually on Page 2 of the document, the first paragraph, third line of the reference, NOAA 2001, Page 7, Table 1. It is actually NOAA 2001, Page 6, Table 1. And then in the following paragraph, the study does not deal with how these numbers generate for coastal California which translate to the Salton Sea and Imperial and Coachella Counties. We probably should remove, strike Imperial and Coachella Counties.

MR. FLETCHER: Did you get those corrections okay?

Now you're the president of United Anglers of Southern California. Can you describe your organization and its membership?

MR. RAFTICAN: Yes. We are a volunteer based organization. We're made up of members. We have regular members, affiliate members. We really speak to some 40,000 affiliated members throughout Southern California. We're really dedicated to quality fishing today and tomorrow. We look to scientifically manage our fisheries so that not only we have got good fishing, that our kids can follow up with good fishing. We run a number of different programs. This past year in 2001 our volunteers put in over 20,000 hours and released over 100,000 juveniles, white sea bass, up and down the California coast. We've got kids fishing programs where we take between 6- and 7,000 kids out on the water fishing and instilling in them good conservation values along the line.

We work with a number of programs up here, the committees that I sit on, and we always work with the Legislature for good fishery legislation.

MR. FLETCHER: Do members of United Anglers fish the Salton Sea?

MR. RAFTICAN: Yes, they do. It's interesting, I've run into our members on a wide basis, whether -- literally from Santa Barbara County all the way down through San Diego. Some of them actually spend a significant amount of time targeting fish in the Salton Sea.

MR. FLETCHER: Why is that? Why are United Anglers

interested in fishing?

MR. RAFTICAN: It is just fishermen interested in it. I think Bill hit the nail right on the head. It's an opportunity to go out and catch quality fish on a regular basis. There aren't many places you can really expect to go out and spend a day and catch numbers of fish over ten pounds. This is not only just reservoirs in Southern California, but this really is a phenomenon that doesn't happen. You know, I think in the height in albacore season you might be able to target boats that are running a hundred miles out of port and might have the same degree of success. But really it is a very successful fishery, and it generates interest in it.

MR. FLETCHER: You mentioned in your written testimony corvina fishing, especially. What is special about corvina?

MR. RAFTICAN: I said before we released a hundred thousand juvenile white sea bass. Basically white sea bass are comparable to corvina. They're a great fish, an aggressive fish. You can fish them with not only bait, you can fish them with plastics. One of the questions earlier was if those squiggly lures -- they design lures specifically for fishing. They call them plastics.

There are a number of companies that manufacture them. They do special colors specifically for the Salton Sea, fish trap lures, Kalin lures. There are a number of different

companies that do specifically for that. They're just a great fish to catch and, like I said, it is fun to catch them fishing. And the another thing is you can simply fish with bait and expect you can -- you can literally go out and expect to get quality fish.

MR. FLETCHER: I'll ask you a couple of the same questions I asked Mr. Karr.

If the fishery at the Salton Sea declines or disappears, where can anglers go for a comparable experience?

MR. RAFTICAN: Even in my testimony, I said it is very difficult to find a comparable fishery to this. Traveling very far off shore for albacore or down off Cabo San Lucas, the only times I know you can really go out and expect to catch fish, and actually those two are in season, where the Salton Sea is generally a year-round fishery. It is a unique fishery.

The Colorado River you can go, and it is not that you can't catch fish there, you can't expect to catch fish on such a regular basis. It really is a unique fishery.

MR. FLETCHER: Let's turn to some of the economic impacts of sport fishing. I think that is a special concern of yours.

Is that correct?

MR. RAFTICAN: Yes, it is. Special.

MR. FLETCHER: Your testimony references a recent study of coastal fishing prepared by the National Marine Fishery Service, which is -- that study is Defenders' No. 20. Why has NMFS prepared this study?

MR. RAFTICAN: They are required to do it by law. I think probably the best thing to do is take a look at why are they required. Recreational angling forms a giant portion of the fishing off the Pacific Coast. Actually it is economically a giant engine. It was interesting, there was a 1992 study by University of California at Berkeley and in that it allocated commercial and recreational fishing for the State of California. And the total value at that time was $5.57 billion. Out of that $5.57 billion, 5 billion could be directly attributed to recreational fishing and 700,000,000 to commercial fishing. So this is why NMFS gets involved with these surveys. We are talking big dollars. They're concerned.

MR. FLETCHER: What types of -- what area and types of fishing does the NMFS report we are talking about right now cover?

MR. RAFTICAN: The NMFS report that we are talking about right now covers -- it was actually done for the Pacific Coast and a very specific region within that region, the state of California. These are marine fisheries up and down the coast.

MR. FLETCHER: Can you describe some of the findings of that report?

MR. RAFTICAN: The findings of that report show again what I'm saying, that recreational fishing is a very, very large engine, as far as the economics in the State of California. I think in Southern California the median range for overall dollar volume was about $2.5 billion.

When you look at $2.5 billion, it is really important because it is not only the day cost of the trips, but the cost of the equipment involved. When you start looking at this, there are significant impacts to that, and in that instance in particular to Southern California.

MR. FLETCHER: Are the expenditures that are not made on the day of the trip or not classified as daily expenditures within that NMFS report, are they an important category of expenditures?

MR. RAFTICAN: Sure. They're an extremely important category. I think in that report they look at boat owners for one thing. There are tremendous dollars involved with that. But more than that, just the average angler. The cost in tackle, the nonrenewable stuff that is not just used that particular day. It's very, very large dollars, and when you start adding that up, especially on a regionwide basis, we're talking about very large dollars.

MR. FLETCHER: Does the NMFS study cover the Salton Sea?

MR. RAFTICAN: No.

MR. FLETCHER: What conclusions regarding Salton Sea can you draw from that study?

MR. RAFTICAN: I think you can take a look at the very parallel inference. Granted the Salton Sea, you're fishing saltwater as opposed to sweet water. But really, I think probably the most important thing is you take a look at both. You get a good idea, a good feel, of the economic impact of recreational angling.

I think the NMFS study did a very good job of showing where these dollars are up and down the coast. And, again, when we take a look at whether it is the Salton Sea or the NMFS study for the coast, people that go fishing buy equipment, whether that equipment is the rod or reel or the boat or the truck that they use to tow that boat or the RV that they stay in while fishing, these are very, very big dollars, and they have a tremendous economic impact.

Those same dollars, although -- not those same dollars, similar dollars spent on the Salton Sea. I think it is just a good parallel study that gives you an idea where to go. When we looked at these other studies that have delineated between fresh and saltwater, there is almost a multiplier effect. And I think the last one through the American Sportfishing Association done -- funded by the National -- one of the studies done by the American Sportfishing

Association when they look at the parallel of those two, they found out that roughly 40 percent of the dollars spent -- the ratio was about 40 percent freshwater to 60 percent saltwater dollars.

I'm just saying the study is a good place to kind of lay out the fact that these are very large dollars, look at it. It is a good way to start out to look at the situation.

MR. FLETCHER: You reviewed some of the portions of the EIR for sportfishing?

MR. RAFTICAN: Yes.

MR. FLETCHER: How many anglers does the EIR say use the Salton Sea on an average annual basis?

MR. RAFTICAN: On an annual basis, the EIR/EIS says that 400,000 people go to the Salton Sea for sportfishing.

MR. OSIAS: Excuse me, Mr. Chairman. Again, just for clarification, this is the transfer EIR/EIS, right?

MR. FLETCHER: This is the transfer EIR/EIS.

Thank you.

MR. OSIAS: Not the Salton Sea restoration?

MR. FLETCHER: No, it is not. It's the transfer DEIR/DEIS.

In a separate section of the EIR there is an estimate of the impacts of the -- the economic impact of loss of recreational opportunities because of the transfer.

Can you tell me what the value, the present value, that the EIR recites for loss of recreational opportunities is?

MR. RAFTICAN: I think the Department of Fish and Game set that -- with the collapse of the fishery 11 years earlier, it set the loss of about $790,000,000. That was overall. That wasn't specific to fish. That was overall economic loss for recreational.

MR. FLETCHER: There is not a lot of detail on how that study was conducted?

MR. RAFTICAN: No.

MR. FLETCHER: To the extent you can tell from the EIR, was that study based on daily expenditures?

MR. RAFTICAN: As I understand it, that was based on daily expenditures that did not include the equipment cost.

MR. FLETCHER: It did not take into account expenditures on rods, reels, boats, other fishing related equipment?

MR. RAFTICAN: No.

MR. FLETCHER: I have no more questions.

Thank you.

CHAIRMAN BAGGETT: Thank you.

With that, Mr. Gilbert.

MR. GILBERT: Nothing.

Thank you.

CHAIRMAN BAGGETT: Mr. Du Bois.

MR. DU BOIS: Nothing.

CHAIRMAN BAGGETT: Mr. Rodegerdts.

MR. RODEGERDTS: Nothing.

CHAIRMAN BAGGETT: Mr. Rossmann.

MR. ROSSMANN: I will say nothing if Mr. Osias will join me in that.

Your Honor, we have no questions. I hope Mr. Osias follows that precedent.

CHAIRMAN BAGGETT: National Wildlife.

MR. DOYLE: No questions.

CHAIRMAN BAGGETT: Audubon.

Sierra Club.

PCL.

MS. DOUGLAS: No questions.

CHAIRMAN BAGGETT: Salton Sea Authority.

MR. KIRK: In the same spirit, no questions.

CHAIRMAN BAGGETT: San Diego.

MR. SLATER: Sorry to spoil the party.

MR. ROSSMANN: They want to ruin Mission Bay.

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CROSS-EXAMINATION OF DEFENDERS OF WILDLIFE

BY SAN DIEGO COUNTY WATER AUTHORITY

BY MR. SLATER

MR. SLATER: Good afternoon, gentlemen. Nice to hear from such avid fishermen.

Mr. Karr, it's your testimony that the Salton Sea is a unique resource, correct?

MR. KARR: That's correct.

MR. SLATER: The fishing there is some of the best you've ever seen?

MR. KARR: Very definitely.

MR. SLATER: You're passionate about fishing?

MR. KARR: Among other things.

MR. SLATER: That's good to hear, but I'm not going there.

Mr. Raftican, your testimony is that recreational fishing constitutes a large economic engine, correct?

MR. RAFTICAN: Correct.

MR. SLATER: In fact, in California it is a billion dollar industry, correct?

MR. RAFTICAN: Multi billion dollar.

MR. SLATER: Mutli billion dollar?

MR. RAFTICAN: Right.

MR. SLATER: Mr. Raftican, you are the -- I forgot the association you're the president of.

MR. RAFTICAN: President of the United Anglers of Southern California.

MR. SLATER: There are thousands of members, correct?

MR. RAFTICAN: Yes, correct.

MR. SLATER: Do you believe that anglers such as

yourself and those that you're associated with would be willing to pay a special license fee for the right to fish in Salton Sea?

MR. RAFTICAN: Right now we pay the highest license fees, I believe, anywhere in the United States to fish in the state of California. I don't think anybody is anxious to pay a higher license fee.

MR. SLATER: How about if I told you that the money that was taken through that fee would be earmarked for the restoration of the Sea?

MR. RAFTICAN: We work on a program called the Ocean Resources Enhancement Hatchery Program which every year every recreational angler fishermen in the ocean south of Point Conception puts a stamp that cost $2.65 on his license, his or her license, and that goes to raising and releasing of white sea bass or other threatened species. There is a similar program in Northern California for striped bass.

So there is precedent for those programs, and I think most anglers are willing to work in conservation areas, especially very clearly delineated for that particular area.

MR. SLATER: Mr. Karr, what about you?

MR. KARR: I would concur. When I was head of the Salton Sea Coordinating Council, that was one of the

concepts for funding that program, yes.

MR. SLATER: That is --

MR. KARR: It's a use support fee for the Salton Sea.

MR. SLATER: Mr. Karr, do you have an estimate of how many anglers use the Sea on an annual basis?

MR. KARR: My guess would be 400,000 is the figure. I think there is more than that, probably, because they don't keep count of the people that come in from other sides of the Salton Sea.

MR. SLATER: And those people come from everywhere, not just Imperial and Riverside County?

MR. KARR: Absolutely. I think the use figure is much higher out of county than in county.

MR. SLATER: Do you have an opinion as to whether $5 an angler per year would be a prohibitive expense?

MR. KARR: It would for some of the families. There is a lot of low income families that go down there and do literally fill their freezers with fish fillets. I think it would be tough on some of them, but I think generally speaking it would be received okay.

MR. SLATER: I have no further questions.

Thank you.

CHAIRMAN BAGGETT: Mr. Osias.

MR. HATTAM: Mr. Osias will not pester you. I will. He can confirm Mr. Rossmann's --

CHAIRMAN BAGGETT: Is that on the record, Mr. Osias pesters people?

UNIDENTIFIED AUDIENCE MEMBER: That is all over the record.

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CROSS-EXAMINATION OF DEFENDERS OF WILDLIFE

BY IMPERIAL IRRIGATION DISTRICT

BY MR. HATTAM

MR. HATTAM: Good afternoon. My name is Mark Hattam. I am representing the Imperial Irrigation District.

Mr. Karr, I will start with you for a few questions.

The Western Outdoor News, that is a newspaper; is that correct?

MR. KARR: Weekly fishing, largest in the United States.

MR. HATTAM: It's geared towards fishermen who want to read stories about fishing, know a good place to fish, that kind of thing?

MR. KARR: Almost entirely where to go, how the fishing is now.

MR. HATTAM: The Western Outdoor -- is it Western Outdoor Magazine or Western Outdoor --

MR. KARR: Correct, Western Outdoors Magazine.

MR. HATTAM: You are an editor of that?

MR. KARR: Yes, sir.

MR. HATTAM: That is a monthly, full color magazine?

MR. KARR: Ten times a year, yes, sir.

MR. HATTAM: That's the same kind of thing, the newspaper, correct?

MR. KARR: Indeed.

MR. HATTAM: Now, I think in your testimony you state that you did a feature in the magazine recently on the Salton Sea?

MR. KARR: Correct.

MR. HATTAM: When was that?

MR. KARR: Two years ago, I think, 2000.

MR. HATTAM: Your testimony says, Page 1, Western Outdoors Magazine, February of last year.

MR. KARR: February 2001.

MR. HATTAM: Did you write that article?

MR. KARR: Yes, I did.

MR. HATTAM: In that article were you giving sort of tips to fishermen of where good spots were to go fishing, that sort of thing?

MR. KARR: It was kind of a historical thing also from my understanding about the Salton Sea.

MR. HATTAM: You talked about the present Salton Sea and fishing there now?

MR. KARR: I believe I did, yeah. I'm sure I did.

MR. HATTAM: Do you recall in that article in Western

Outdoors Magazine if you informed your readers that there was a health advisory about eating fish from the Salton Sea?

MR. KARR: I can't remember for sure.

MR. HATTAM: I'm going to ask you to look at your testimony. Can you show me in your testimony where you informed this Board that there is a health advisory about eating fish at the Salton Sea? I am looking at your written testimony for this hearing.

MR. KARR: I think that's pretty well been covered here. I didn't see any reason to mention it.

MR. HATTAM: You knew it was going to be covered here so you just didn't bother to put it in your testimony?

MR. KARR: Yeah.

MR. HATTAM: You thought about it ahead of time before you wrote your testimony?

MR. KARR: Didn't even pass my mind, to be perfectly honest.

MR. HATTAM: This book you wrote, that book you wrote was in the '80s?

MR. KARR: '85.

MR. HATTAM: Is that book still in print, being sold to people?

MR. KARR: Yes, it is.

MR. HATTAM: So there is still a few dollars coming in?

MR. KARR: Not being sold too much. The state park has

them down there.

MR. HATTAM: If someone is interested, they can buy one?

MR. KARR: Yes, that's true.

MR. HATTAM: If I wanted one, I could buy one from you?

MR. KARR: From them, not me.

MR. HATTAM: Is that book -- when was the last time that the book was printed?

MR. KARR: One printed in '85.

MR. HATTAM: That hasn't been updated with any information about health advisories of the Salton Sea?

MR. KARR: No. Those came about the following year. I believe it was '86.

MR. HATTAM: Your book, which is attached as -- or Xeroxed, I guess. I guess there is no copyright infringement since you are a witness?

MR. KARR: I gave my permission.

MR. HATTAM: Defenders' Exhibit 10, Fishing Salton Sea. That is your book?

MR. KARR: Right.

MR. HATTAM: There is a number of chapters in there and hears comments about how to cook the various fish that you catch at the Sea?

MR. KARR: Right.

MR. HATTAM: You are giving tips to people about the

way fish will taste the best?

MR. KARR: Sure.

MR. HATTAM: There was nothing in this book in the mid '80s about any health advisories because they hadn't happened?

MR. KARR: Right.

MR. HATTAM: When is the last time in the newspaper, do you recall, that a newspaper ran any feature story about fish at the Salton Sea?

MR. KARR: Every week. Not a feature story, I'm sorry. We report on the Salton Sea every week. Probably last year when I was fishing down there.

MR. HATTAM: Is it fair to say that the newspaper has little summaries of different places around the state how the fishing is going?

MR. KARR: Yes, I believe that is what we do.

MR. HATTAM: So that is one of the reasons people buy the newspaper, they look at that to see where the hot spots are for fishing?

MR. KARR: Exactly.

MR. HATTAM: Do you recall if the newspaper has ever printed to its readership that there was a health advisory about eating fish from the Salton Sea?

MR. KARR: I don't think we have space to do that. There is 24 places that have warnings along the coast

in Southern California not to eat the fish, all of San Francisco Bay, all of the Delta. If we wrote, caution, beware of eating the fish about every story, we wouldn't have room in the paper.

MR. HATTAM: Do you know if it is posted down at the Salton Sea?

MR. KARR: Yeah. I believe it is at a few locations.

MR. HATTAM: Have you been around the whole Sea?

MR. KARR: Many times.

MR. HATTAM: You remember seeing a few posted, but not a lot?

MR. KARR: At the state park, I think, at public locations. I know there is none at the launch ramp down at Red Hill Marina area, those places.

MR. HATTAM: You grew up around the Salton Sea and fished there are basically your whole life, as you can recall?

MR. KARR: True.

MR. HATTAM: The Sea used to be a very, very popular destination for a lot of people, correct?

MR. KARR: Yeah. I used to fish there often, North Shore Marina when it was still in operation and people were -- lots of boats down there.

MR. HATTAM: Today, even though there are people that still obviously go there to visit and fish and whatnot, it

is not like it used to be, is it?

MR. KARR: Right.

MR. HATTAM: You would prefer, if you could, wouldn't you, that it would go back to being the way it used to be?

MR. KARR: Very definitely, yes.

MR. HATTAM: Have you been fishing there at times when there were massive bird and fish die-offs?

MR. KARR: Fish die-offs, yeah. The bird die-offs I had never even seen or heard one until the last three or four years. I mean, an occasional bird would die, but nothing like the recent stuff.

MR. HATTAM: In the last three or four years you have personally seen massive bird die-offs?

MR. KARR: Fish die-offs, not bird. I read about them.

MR. HATTAM: Didn't actually see them?

MR. KARR: No, I did not.

MR. HATTAM: When there were large fish die-offs, did you notice any drop off in fishermen?

MR. KARR: No, no. Quite the contrary. The fish die-offs are from a matter of too healthy a Salton Sea instead of too unhealthy a Salton Sea.

MR. HATTAM: You didn't notice -- it didn't affect anglers that there was thousands of dead fish floating around?

MR. KARR: No. It had an effect on shore use to a certain extent. People didn't swim too much in the areas. But, of course, those were relatively limited so you still could go someplace else.

MR. HATTAM: Thank you.

MR. KARR: Certainly.

MR. HATTAM: Mr. Raftican, is it fair to say that United Anglers of Southern California is basically -- one of the functions is to advocate fishing concerns on behalf of fishermen?

MR. RAFTICAN: I think that is fair to say.

MR. HATTAM: Is United Anglers of California, the Southern California entity is a subchapter or is there --

MR. RAFTICAN: No, we are independent, two separate organizations.

MR. HATTAM: You were asked some questions about the cost issues, and you were asked to compare a study that is referenced in your testimony on Pages 1 and 2 by -- I guess, pursuant to the National Marine Fishery Service, to analyze the economic impacts of management policies on fishing participants in coastal communities, and they had -- you say here that there was a document report that offers on Page 2, quote, a cost analysis of saltwater sportfishing on the Southern California coast and deals with the type of fishing that is similar in some respects to what we do in the Salton

Sea.

Do you have the testimony there in front of you?

MR. RAFTICAN: Yes, sir.

MR. HATTAM: I ask you to have it in front of you. I am going to ask some questions about the material you have there.

When you were asked on direct, I think you made a distinction between freshwater and saltwater. But this report is actually about saltwater sportfishing on the Southern California Coast, correct?

MR. RAFTICAN: Correct. The National Marine Fishery Service report is on that.

MR. HATTAM: This report that you are comparing to the Salton Sea theoretically was a saltwater report, right?

MR. RAFTICAN: Correct.

MR. HATTAM: You say compared in some respects to fishing at the Salton Sea. Do you know if this report considered the economic benefits to Southern California of the San Diego sportfishing fleet?

MR. RAFTICAN: It would have taken some of that into consideration, yes.

MR. HATTAM: When I say San Diego sportfishing fleet, I'm thinking in particular of, say, for example, H&M Landing. Are you familiar with H&M Landing?

MR. RAFTICAN: Yes.

MR. HATTAM: Are familiar with Point Loma Sportfishing?

MR. RAFTICAN: Yes.

MR. HATTAM: Familiar with Fishermen's Landing?

MR. RAFTICAN: Yes.

MR. HATTAM: Familiar with Sea Sport Sportfishing?

MR. RAFTICAN: Yes.

MR. HATTAM: Exclusive of Sea Port which is a little bit, a few miles up the coast from downtown San Diego. The other landings that I mentioned, H&M, Point Loma and Fishermen's Landing are just a mile or two from the airport in San Diego, correct?

MR. RAFTICAN: Correct.

MR. HATTAM: Do have any idea how many boats run out of those three landings?

MR. RAFTICAN: I can take a rough stab.

MR. HATTAM: Would you, please?

MR. RAFTICAN: I would say probably totally 18, 20 boats.

MR. HATTAM: Of the three landings total?

MR. RAFTICAN: Yes.

MR. HATTAM: That includes one-day trips, half-day trips, multi day trips out of those landings, just 18 boats?

MR. RAFTICAN: A guess.

MR. HATTAM: Okay. That is a guess.

Now, the boats that run out of there, there are boats

that go on multi day trips into Baja California, correct?

MR. RAFTICAN: Used to be.

MR. HATTAM: Used to be?

MR. RAFTICAN: Stopped them.

MR. HATTAM: So there is no more boats going --

MR. RAFTICAN: They are still going.

MR. KARR: Not just the islands.

MR. RAFTICAN: Yes, there are still multi day trips out of there.

MR. HATTAM: Mr. Karr jumped in there with an exclusion. It is correct, isn't it, that the Mexican government has restricted American sport fishermen from going to particular areas down off Baja California?

MR. RAFTICAN: One particular area, which is in the Mexican biosphere. They are waiting for the results. They to had issue permits. They're waiting for the results of one of the studies.

MR. HATTAM: Other than that, the San Diego sportfishing fleet can run down into Baja California?

MR. RAFTICAN: Yes.

MR. HATTAM: Some of the boats go on multi day trips, right?

MR. RAFTICAN: Many of them.

MR. HATTAM: If I wanted to take, say, an eight-to-ten-day trip out of San Diego into Baja California,

about how much would that cost me, just in terms of paying for the boat?

MR. RAFTICAN: Just the trip cost would be probably $200 a day, I would say is probably. Over one day it would probably run -- eight-day trip, $1600.

MR. HATTAM: So say $1600 for the boat to run there. There is some pretty nice boats that go on those multi day trips, right?

MR. RAFTICAN: Very nice.

MR. HATTAM: For example, the Red Rooster and some other real nice boats?

MR. RAFTICAN: Yes.

MR. HATTAM: And those boats have inboard dining on board, don't they? They have kitchens, nice room, you can sit down and have a meal, that kind of thing, galley?

MR. RAFTICAN: Correct.

MR. HATTAM: They have nice sleeping quarters, et cetera?

MR. RAFTICAN: Yes.

MR. HATTAM: Are you familiar with that kind of sportfishing fleet running at the Salton Sea?

MR. RAFTICAN: No.

MR. HATTAM: Are you familiar with the kind of boats running at the Salton Sea, party boats of any kind, that charge people $200 a day to go out onto the Salton Sea and

fish?

MR. RAFTICAN: I believe the guides there, I don't know exactly what the charge is, but I suspect it would be --

MR. HATTAM: You may be able to hire a personal guide to take somewhere?

MR. RAFTICAN: Run small boats, no.

MR. HATTAM: There is no boats of comparable size to the San Diego sportfishing fleet, right?

MR. RAFTICAN: Correct.

MR. HATTAM: So that the magnitude of the dollars involved in sportfishing in Southern California in the ocean dwarf anything at the Salton Sea, don't they?

MR. RAFTICAN: Two things. One, a lot -- there are a lot of party boats that run out of Southern California landings. To my knowledge, when those boats are fishing multi day, they're fishing in Mexico, and I don't believe those are included in the NMFS study. The NMFS study is for the half-day and three-quarter day boats that fish up and down the coast, which, although they are well outfitted, are not the luxury boats that fish the islands up and down off Mexico, Baja.

MR. HATTAM: Even those half-day and three-quarter day and one-day boats that don't cross the border into Mexico, those boats generally have galleys, don't they?

MR. RAFTICAN: Oh, yes.

MR. HATTAM: Don't they hold anywhere from 40 to 60 people generally?

MR. RAFTICAN: Yes.

MR. HATTAM: Let's talk about licensing. Mr. Slater asked you a question about whether you'd be willing to pay or your constituency would pay for licenses to fish the Salton Sea. You made a reference to California has the highest licensing fees in a lot of states or all states. Then you made reference to some stamps.

If I want to go fishing anywhere in California and I want to get every stamp I can, I want to pay my saltwater fishing stamp and everything else for a year, how much is it going to cost me?

MR. RAFTICAN: I would say between 30 and $40, and it could be higher but --

MR. HATTAM: That range?

MR. RAFTICAN: 30 to 50, anyhow. Really honestly, probably 30 to 40.

MR. HATTAM: That would basically cover me for fishing anywhere in the state for the whole year without taking species that are protected?

MR. RAFTICAN: Yes.

MR. HATTAM: There has been some testimony about the economic impact in the Salton Sea to fade away or go away. And you talked about the cost of the EIR/EIS, and you

thought maybe they had applied the sort of daily costs without talking about preparation for fishing, basically, like my licenses, gear, reel, rods, boats, maintenance of the boat, that kind of thing?

MR. RAFTICAN: Yes.

MR. HATTAM: It is your understanding that the EIR/EIS left that out and you think that is important for the Salton Sea?

MR. RAFTICAN: Yes.

MR. HATTAM: There has also been testimony here that most of the people who fish at the Salton Sea, I think Mr. Karr said, his understanding, they come from out of the area, for example, Metropolitan Los Angeles, Riverside County, Orange County, San Diego County, et cetera?

MR. RAFTICAN: I couldn't answer that question. I don't know.

MR. HATTAM: You don't know if the people who are -- when people -- if I'm going to buy a fishing rod and reel and I live in Orange County, as a fisherman would I normally go to where I am going to fish, say the Salton Sea, and then walk down to the tackle shop and start buying reels and rods and line and hooks and jigs? Or would I generally buy it around where I live to get ready for my trip and then go use it where I fish?

MR. RAFTICAN: Any good fisherman would buy both.

MR. HATTAM: You might buy something where you are going?

MR. RAFTICAN: This is personal experience. This is not any --

MR. HATTAM: One of the things you might do is walk to the local tackle shop and say, "Hey, Mr. Salesman, what are they biting on right now"?

MR. KARR: Absolutely.

MR. RAFTICAN: Sure, you do that.

MR. HATTAM: The salesman maybe is going to tell you, "They are biting on brown plastic right now." So you might spend a dollar or two and buy some if you don't have some in your tackle?

MR. RAFTICAN: Yes.

MR. HATTAM: But generally speaking, on the big expensive items, rod and reel, a boat, those kinds of things, generally speaking aren't you buying those things in the area in which you live as opposed to a distant location that you go to fish out?

MR. RAFTICAN: Some of those are very emotional sales, and I would hate to say that they all got bought at home. Fishermen's wives out there, they would know that it is a danger whenever he walks into that tackle shop.

MR. HATTAM: It was a very good answer, but it was not what I asked. What I asked was generally speaking. I

didn't ask in every circumstance.

MR. RAFTICAN: You know, you're going to buy some tackle there. I don't mean to be evasive. I just -- I do believe you would spend some money there and probably some on equipment over and above just the stuff that you use for for the day.

MR. HATTAM: Right. But you would also buy some of the expensive material back home, right?

MR. RAFTICAN: Yes.

MR. HATTAM: In fact, boats, for example, you wouldn't generally show up at the Salton Sea and decide, I would like to buy a boat today to go fishing here; you would probably have a boat already that you towed in there or you bought somewhere else and then kept there?

MR. RAFTICAN: Bought somewhere to go fishing at the Sea, yes.

MR. HATTAM: There is an exhibit that IID has marked 69, which is a Draft EIR/EIS which will be submitted in rebuttal testimony.

You were not here yesterday, correct?

MR. RAFTICAN: Correct.

MR. HATTAM: This is a document called Draft Salton Sea Restoration Project Environmental Impact Statement/Environmental Impact Report. I am going to ask you to turn to Page 3-137. Give you a minute to find it.

MR. RAFTICAN: Got it.

MR. HATTAM: There is table there that lists all the Salton Sea's State Recreation Area visitation data. I will represent to you that a Dr. Brownlie with an outfit called Tetra Tech was in here yesterday and testified that he was the one that prepared this document.

This chart by Tetra Tech shows Salton Sea State Recreation Area visitation data, it is called. And it shows, for example, in 1999 275,000 people visited the state recreation area.

You see that?

MR. RAFTICAN: Yes.

MR. HATTAM: There was some testimony I think by Mr. Karr that more people come to the Salton Sea than just go to the Salton Sea State Recreation Area. Is that your understanding, too?

MR. RAFTICAN: I suspect, yes.

MR. HATTAM: You are not sure?

MR. RAFTICAN: No, I'm not sure where they go.

MR. HATTAM: There was some testimony that maybe there was 400,000, and I think you even testified the EIR said there were 400,000 --

MR. RAFTICAN: Correct.

MR. HATTAM: -- people fishing at the Salton Sea every year or visiting?

MR. RAFTICAN: Yes. That was their number.

MR. HATTAM: This apparently just covers the state recreation area, but you will see that Dr. Brownlie says that the total revenue of those 275,000 people to the area there is $130,000 and the spending per visitor is 47 cents. Now, I take it from your testimony you would disagree with Dr. Brownlie's analysis?

MR. RAFTICAN: I don't have the background behind this. Just on face value, yes, I would disagree with this, dramatically.

MR. HATTAM: There was another exhibit marked here today which is IID Exhibit 75. May I approach? I will show you a copy of it. This was printed off the U.S. Fish and Wildlife Service Pacific Region webpage. It is talking about mortality, wildlife mortality estimates. You will see on the second page of the U.S. Fish and Wildlife Service Pacific Region says massive fish kills occur frequently to Salton Sea, resulting in millions of fish killed in a year. The predominant fish species in the Salton Sea is tilapia. The sport fishery in the Salton Sea is nonexistent today.

Do you see that?

MR. RAFTICAN: Yes.

MR. HATTAM: I take it you would disagree with that, also?

MR. RAFTICAN: Yes, I would.

MR. HATTAM: Mr. Karr, I have one other question that I forgot to ask you. You mentioned that fishing -- something about sunken buildings.

MR. KARR: Yeah.

MR. HATTAM: As a fisherman, it's true, isn't it, that a lot of species of fish like to gather around what we call fishing structure?

MR. KARR: Right. It's best in the kitchen in that building, by the way.

MR. HATTAM: The structure that you are talking about -- when you say sunken buildings, you are talking about buildings that have been flooded at the Salton Sea; is that right?

MR. KARR: Actually it is the hotel that Bob Hope stayed in where they filmed The Road to Morocco.

MR. HATTAM: There is other parts of the Sea where there is structure -- there is buildings under water, right?

MR. KARR: Very definitely.

MR. HATTAM: Are some of those good fishing spots, also?

MR. KARR: Yes, they are.

MR. HATTAM: That is all.

Thank you.

CHAIRMAN BAGGETT: Staff, do you have any?

Any direct, Mr. Fletcher?

MR. FLETCHER: Yes, I have a few.

CHAIRMAN BAGGETT: Take a five-minute break.

(Break taken.)

CHAIRMAN BAGGETT: Back on the record.

Redirect.

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REDIRECT EXAMINATION OF DEFENDERS OF WILDLIFE

BY MR. FLETCHER

MR. FLETCHER: I have a couple very short questions for Mr. Karr. And if the Board would like, we will move on to air quality stuff after that. Couple short questions.

First, the health warning that applies to fish caught at the Salton Sea, that is listed in the fishing regulations for freshwater fishing in the state, correct?

MR. KARR: That's correct.

MR. FLETCHER: So if you buy a license at a Fish and Game office, bait shop, and you read the regs, you know there is a warning?

MR. KARR: Sure. Absolutely.

MR. FLETCHER: Now, are there warnings for other fish in freshwater and ocean fish?

MR. KARR: Very definitely. They have specific warnings of what species of fish you can eat and how much is recommended for you to eat. All of San Francisco Bay is included in the warning, all of the San Francisco Delta

system is included in the warning.

Fish that live in that certain body of water year-round rather than ones that go in and out to the main ocean are more susceptible because they have a better chance of collecting mercury or in the case of Salton Sea selenium.

MR. FLETCHER: Are striped bass included?

MR. KARR: Yes, they are.

MR. FLETCHER: Stripers are pretty important for the fishery, right?

MR. KARR: Very definitely. Has been one of the major fish up there.

MR. FLETCHER: I am asking as a reader here, when you read an article in the newspaper about stripers, does it typically say that there is a health warning on stripers in the Bay?

MR. KARR: Never.

MR. FLETCHER: Now let's go back to the warning for fish at Salton Sea. Does that warning say you should never eat fish from the Salton Sea or just prescribe limits?

MR. KARR: Oh, no. It just says not to eat too much. I don't like it for breakfast, lunch and dinner, anyway.

MR. FLETCHER: Do sports people only catch fish as food to eat?

MR. KARR: Certainly not. Catch and release is becoming more and more important. For instance, the youth

outdoor sports fairs that I hold here with the International Sportmen's Expo, at the kids' fishing pond, rather than letting the kids catch a fish and keep it, that is all catch and release. There is hundreds of kids in line to do that all the time.

MR. FLETCHER: You can have a good day fishing without having a meal that night?

MR. KARR: Very definitely.

MR. FLETCHER: Thank you.

CHAIRMAN BAGGETT: Recross.

Mr. Gilbert.

Dr. Du Bois.

Mr. Rodegerdts.

MR. ROSSMANN: No, sir.

CHAIRMAN BAGGETT: Imperial County.

National Wildlife.

Audubon.

PCL.

Salton Sea Authority.

San Diego.

MR. SLATER: Just kidding.

CHAIRMAN BAGGETT: IID.

MR. HATTAM: No.

CHAIRMAN: You have one more witness before we do your rest.

MR. KARR: Thank you very much for your time.

CHAIRMAN BAGGETT: Thank you for making the trip.

(Break taken.)

CHAIRMAN BAGGETT: Back on the record.

MR. FLETCHER: Did you get sworn before, Mr. Schade?

MR. SCHADE: Yes, I did.

MR. FLETCHER: Mr. Schade, nice to see you.

Can you describe yourself, identify yourself for the record and describe your background?

MR. SCHADE: My name is Theodore Schade. I am senior project manager for the Great Basin Air Pollution Control District headquartered in Bishop, California. We enforce air pollution laws for three counties in California, Inyo, Mono and Alpine Counties, basically the area east of the crest of the Sierra Nevada. I'm a professional civil engineer. Background in environmental engineering and water resources.

MR. FLETCHER: Do you recognize the document that is sitting in front of you which is Defenders' Exhibit No. 17?

MR. SCHADE: Yes, I do. It is my written testimony.

MR. FLETCHER: Are there any changes or corrections you would like to make to your testimony at this time?

MR. SCHADE: Very minor typo on Page 3, about the third paragraph down. I refer to this Board as the SWRCD. It should be the SWRCB.

MR. FLETCHER: Thank you.

With that correction, this is correct to the best of your knowledge at this time?

MR. SCHADE: Yes, it is.

MR. FLETCHER: Have you testified previously before this Board regarding air quality problems related to inland saline lakes?

MR. SCHADE: Yes, I have. In 1994 I believe I sat at this same table and testified regarding the City of Los Angeles' application to divert water from Mono Lake.

MR. FLETCHER: How did the Board address the air quality problems at Mono Lake in its decision in that proceeding?

MR. SCHADE: I believe the Board relied that the air quality issues at Mono Lake were significant and, in fact, set lake levels at Mono Lake that would ensure that the federal PM-10 standards would be meet by essentially raising the lake level.

MR. FLETCHER: What kind of technical analysis did the Board base its decision on in that proceeding?

MR. SCHADE: I think there were a number of analyses. But probably the most critical and most important that actually set a level was through air quality modeling. The Great Basin District, my district, prepared a model. The City of Los Angeles' EIR consultant also prepared a model.

Each of the models attempted to determine how high the lake had to come up, and both models were amazingly similar. We came up with a common answer as to how high the lake had to be in order to meet that federal standard.

MR. FLETCHER: That Board decision, I should say excerpts of that Board decision, are in your testimony as Exhibit 18?

MR. SCHADE: Yes, they are.

MR. FLETCHER: You currently work at Owens Lake for the Great Basin?

MR. SCHADE: That's where I spend most of my time, yes.

MR. FLETCHER: Can you tell us briefly how your experience at Owens Lake is relevant to this proceeding?

MR. SCHADE: I think what we see now at the Salton Sea is something that occurred, although in a very different manner, a hundred years ago at Owens Lake. A hundred years ago or nearly a hundred years ago the City of Los Angeles decided that they wanted the water from Owens Valley. They constructed the Los Angeles Aqueduct. And Owens Lake is similar to the Salton Sea in that it is a basin lake, like the Salton Sea.

Once that source of water, in the case of Owens Lake, the Owens River was diverted away from the lake, over not too many years the Owens Lake disappeared or nearly disappeared. It's not quite gone today.

MR. FLETCHER: Can you tell us what PM-10 air pollution is and why it is a problem?

MR. SCHADE: PM-10 is a particulate matter with an average air dynamic size of ten microns or less. With respect to your hair it's about 70 microns in diameter. So these are very, very fine dust particles. The reason that they are a pollutant, considered a pollutant by the EPA and the State of California, is not what they are made out of. They can be a completely inert substance. It is the fact that these very small particles get very deeply into our lungs. We don't have a good -- our body doesn't have a good mechanism to expel these small particles once they do get deeply lodged in our lungs.

So the state and federal government have established standards for PM-10 due to the health problems that they cause.

MR. FLETCHER: Can you describe PM-10 emissions at Owens Lake?

MR. SCHADE: Not adequately. They are -- we have extremely high emissions of PM-10, both on a per ton basis over the course of a year or in the course of a storm. And we have very, very high levels of PM-10 that come off the lake. Probably the best thing that I could -- an example that you might be aware of, might make it appropriate or people might be able to visualize it, would be in the middle

of the worst forest fire. Actually if you recall seeing video from the collapse of the World Trade Towers, that mass of dust that came at people that were there. Those kind of levels are levels that we see at times at Owens Lake.

MR. FLETCHER: Why is Owens Lake so emissive?

MR. SCHADE: I think -- it's a big question. It's emissive as it is because it's been a dry lake for a very short period of time. The Great Basin or the Western United States is full of dry lakes. But most of those lakes have been naturally dry for hundreds to, in most cases, thousands of years. Owens Lake has been, in geologic time, has been dry for an instant, and the system down there is still under -- there is a lot of dynamics, a lot of instability in the system. Given hundreds of thousands of years, I think Owens Lake would stabilize. We don't have that luxury, though, of those time frames.

MR. FLETCHER: Why don't you have that luxury of hundreds of thousands of years?

MR. SCHADE: Owens Lake is considered by the federal government to be an anthropogenic source of air pollution, which means that man-caused source of air pollution. And the Clean Air Act requires those anthropogenic sources -- they give a timeline for taking care of those air pollution problems.

MR. FLETCHER: Is the Great Basin Air Pollution Control

District working to control those problems?

MR. SCHADE: Yes, we are. We have been for quite some time.

MR. FLETCHER: How is BGAPC, not sure I have that acronym right, controlling PM-10 emissions at Owens Lake?

MR. SCHADE: We developed -- in 1998 we developed what is called a State Implementation Plan, which is the federal government requires every state to submit a plan detailing how each area that is a nonattainment for criteria limit, how those areas will be brought into attainment. The state has given that responsibility for preparing those plans to the local air districts. So my air district, the Great Basin District, was responsible for preparing a plan. We did so and submitted it to the EPA for approval in 1998. So there is a plan in place that has been federally approved.

MR. FLETCHER: What are some of the measures that you use to control dust emissions?

MR. SCHADE: The plan contains three approved measures; really only two of which are contemplated for implementation at this point. The measures include what we call shallow flooding, which essentially wetting the dusty areas down; managed vegetation, which is farming or growing plants on the dusty areas; or gravel blanket, which is a four-inch thick layer of gravel that is laid down over the dusty areas.

The City of Los Angeles is currently implementing shallow flooding and managed vegetation at Owens Lake.

MR. FLETCHER: How much money has been spent so far?

MR. SCHADE: Approximately $180,000,000.

MR. FLETCHER: What do you expect the total cost of all of the measures to control air pollution?

MR. SCHADE: It is hard to come up with a firm estimate. We are about half done, maybe more than half done. We may be more than half done with respect to some of the expensive infrastructures like tie to the aqueduct and things like that. I would expect somewhere on the order of 300,000,000 to be spent before the work is done.

MR. FLETCHER: You mention the water is part of your strategy to control issues as well?

MR. SCHADE: Yes.

MR. FLETCHER: How much water will the project require?

MR. SCHADE: Our estimates are that about 15 percent of the city's diversion from the Owens Valley will be required, about 15 gallons back for every hundred gallons they take. That will be about 50,000 acre-feet a year.

MR. FLETCHER: What is the value of that water?

MR. SCHADE: The value of the water is about $320 acre-feet, about 16- to $17,000,000 a year.

MR. FLETCHER: Is $16.5 million annual cost, is that part of the $300,000,000 that you were just talking about or

is that on top of that?

MR. SCHADE: The value of the water is on top of the capital cost, and that capital cost and the water cost don't include annual maintenance costs, which could be considerable as well.

MR. FLETCHER: Do you have any estimate as how much those would be?

MR. SCHADE: Probably 5- to $10,000,000 a year in other maintenance costs. You are talking probably 25,000,000 a year after the infrastructure has been put in place.

MR. FLETCHER: How long would that 25,000,000 per year fee be required?

MR. SCHADE: As long as the City of Los Angeles diverts water from the Owens Valley.

MR. FLETCHER: Let's move on to Salton Sea. In your opinion, are there some relevant similarities between the experience of Owens Lake and what could happen if seabeds are exposed at the Salton Sea?

MR. SCHADE: Yes. I have been down to Salton Sea three times in about the last year to year and a half, specifically to look at the exposed seabed and working with Salton Sea Science Office, advising them as to whether or not I felt there was potential for dust emissions.

I see a lot of similarities between the two lakes, actually between the three if you throw in Mono. There are

some similarities with Mono as well, although I do see differences.

MR. FLETCHER: What are some of the similarities?

MR. SCHADE: Sediment type. The type of salt crust that forms. The wind -- I've actual seen some wind damaged sediments at Salton Sea that very much remind me of wind damaged sediments that I have seen at Owens Lake. In a couple of places at Salton Sea, if you had blinders on and somebody just dropped you there, you couldn't tell whether you were at Salton Sea or Owens Lake. So, very close resemblance between some of the conditions found at Owens Lake.

MR. FLETCHER: The EIR, you've looked at that?

MR. SCHADE: I've looked at the air quality sections of the EIR.

MR. FLETCHER: That makes only what it calls a qualitative assessment of potential for air quality impacts from seabed exposure?

MR. SCHADE: Yes.

MR. FLETCHER: In your opinion, is a qualitative assessment sufficient given the potential for impacts?

MR. SCHADE: I would say it wasn't sufficient during the Mono Lake hearings in front of the Water Board. It certainly wouldn't be sufficient for any air district that was required to approve a plan and against EPA regulations.

It also requires a mathematical model to be prepared. A quantitative assessment just wouldn't be adequate.

MR. FLETCHER: Does it give you a good sense of how much -- what the potential for air quality impacts are?

MR. SCHADE: Does what?

MR. FLETCHER: Physically does a qualitative assessment give you a good sense of what might happen?

MR. SCHADE: It could.

MR. FLETCHER: Now, would it be possible to make a quantitative assessment of the air quality impacts from seabed exposure, and if so how would you go about doing that?

MR. SCHADE: It would be possible. There is a lot of ways you could do it. One way would be to hire an air modeler, get an air modeler to really look at the conditions. We have some information on exposed sediments that have testified here, know something about the sediments under there.

You could come in, and probably I would bring a portable wind tunnel in to come in and to develop some emission rates. And we have seen testimony as to which areas would be exposed. So something like in areas and emission rates would be required to put together a mathematical model. You could do something more crude, a kind of back-of-the-envelope kind of calculation that I talk

about in my testimony where you just compare it to other sources of air pollution like Owens Lake.

MR. FLETCHER: Have you used quantitative models of this sort that you just described at Owens Lake? Were models used like that used at Mono Lake as well?

MR. SCHADE: Absolutely, yes. They are very important tools to determine, number one, which areas need to be fixed and, number two, how you might go about fixing those areas.

MR. FLETCHER: You developed models?

MR. SCHADE: Personally I didn't develop them, but the district did.

MR. FLETCHER: Would a quantitative model help to estimate the -- by estimating the potential for impacts in a quantitative way, would it help also to estimate potential cost of mitigation measures that might be required?

MR. SCHADE: Yes. Because you don't know how much it is going to cost until you know what the magnitude is of the problem that you have. It is really kind of the first step. Before the engineers can come in and come up with a fix, the air model you need to tell them what to fix.

MR. FLETCHER: In the EIR it is stated that moisture, dried algal mats, threats to sulfate salts, all those would inhibit the suspension of dust to Salton Sea.

In your experience at Owens Lake, do those factors help inhibit the emissions?

MR. SCHADE: No. In some cases with moisture it can actually exacerbate the problem. Dried algal mats are not -- we have seen a lot of dried algal mats. They essentially end up being -- adding to the dust windblown out there, naturally. Sulfate salts. Sulfate salts are slightly less or can be slightly less emissive than the carbonate salts that we see Owens Lake. Owens Lake has a mix of both. You have less carbonate salts at the Salton Sea. The sulfate salts are not nonemissive; they are just slightly less emissive than the sulfate salts -- I'm sorry, than the carbonate salts.

MR. FLETCHER: Now, how about the wind? The EIR also says that the low frequency of wind events will inhibit the suspension of dust. Does the information on winds in the EIR indicate that there are winds present that, let's say, A, could suspend dust, and, B, how do those wind speeds compare to thresholds that you used at Owens Lake?

MR. SCHADE: The Imperial County area is in nonattainment for PM-10 right now, mainly because of windblown dust. So if there is enough wind to blow dust from dirt roads and fields and unpaved parking lots, you have to assume that the wind would be the same, the same winds would blow exposed dust from the lakebed around.

The information presented in the EIR seemed to indicate that -- let me back up.

Our work at Owens Lake has shown that the threshold speed for the initiation of a dust storm is generally around 17 miles an hour. That's the first particles, the first size particles actually move. It's a little bit counterintuitive. You think the size of the smaller particle, the easier it would be to mobilize them with the wind. It is actually fine sand to kind of coarse silt particles that are the first to move. There are dynamic reasons for that.

At about 17 miles an hour uncrusted fine sand and silt start to move. At about 20 miles an hour you get practically everything that is not glued down starting to move. If you look at the EIR, it seems to indicate it is not in a very numerically friendly format. They have a wind rose, and from looking at the wind rose I estimate there is about 13 to 15 percent of the time that wind exceeds those thresholds, the 17-mile-an-hour threshold. That would equate to something on the order of 47 to 55 days a year where you had winds high enough to blow dust.

MR. FLETCHER: Let's talk about the area that might be exposed. We have heard the area of 55,000 acres quite a bit. How does that compare to the emissive surface at Owens Lake?

MR. SCHADE: About twice of what is potentially emissive at Owens Lake. We have an emissive area, a

potential emissive area of about 22,000 acres.

MR. FLETCHER: The EIR states that natural processes could control dust. What is your experience with those at Owens Lake?

MR. SCHADE: Natural processes do control dust. Natural processes take a long time to control large areas of dust all by themselves. We see natural processes occurring at Owens Lake. In fact, the three control measures that I spoke about are really -- one of the things that after a lot of study at Owens Lake that we realize is that we need to mimic natural processes. We aren't going to invent a new way to keep dust down.

So the water and vegetation and the gravel are all natural processes that occur on exposed plyas. They occur very slowly, on the order of hundreds to even possibly thousands of years, certainly not fast enough to meet EPA mandated attainment dates.

MR. FLETCHER: One more question related to similarities. The EIR states that the differences in soil chemistry would keep Salton Sea emissions lower than Owens Lake.

What is your opinion regarding differences in soil?

MR. SCHADE: Soil chemistry?

MR. FLETCHER: Soil chemistry.

MR. SCHADE: It appears there are differences at Salton

Sea that may make the soil chemistry at the Salton Sea more resistant to wind erosion, but not significantly. I guess the thing to keep in mind is when I talk about -- when I spoke about 22,000 acres at Owens Lake that is potentially emissive, I never say that it is emissive. Because at any one time it is usually a much smaller area that actually emits dust, because of a lot of natural processes that take place kind of an annual basis.

MR. FLETCHER: It is the smaller areas that are responsible for the large dust?

MR. SCHADE: Yes. So even though you've got tendencies at Salton Sea that would be towards more stable crust over a larger percentage of the area. There is not enough of a difference to make the problem go away. It just may lower the problem.

MR. FLETCHER: A few minutes ago you said you did a rough quantitative analysis for the potential for dust at Owens Lake. Can you, drawing on your experience at Owens Lake -- I'm sorry, I think I need to restate.

Can you, drawing on your experience at Owens Lake, attempt a rough quantitative analysis of the potential for dust at Salton Sea?

MS. SCHADE: Sure. If you've got, say, 50,000 acres that are exposed, that is about twice the exposed area that you have at Owens Lake. So if it was as emissive as Owens

Lake, then you would have dust levels that potentially -- you would have dust amounts that were twice what they were at Owens Lake.

If you assume that differences in soil chemistry and temperature that we see down at Salton Sea, a lot of other factors may be less emissive, even 10 percent as emissive or 1 percent as emissive, you would still have violations of standard. What you have to realize is that our exceedances at Owens Lake are so far over the standard. The standard is 150 micrograms per cubic meter. We have measured exceedances, 24-hour exceedances at Owens Lake, 20,000 micrograms per cubic meter. That is 130 times the standard.

So even at 1 percent, you've still got exceedances that are over the 150 micrograms. It doesn't take a lot of dust. It doesn't take a lot of area to exceed the federal PM-10 standard.

MR. FLETCHER: I believe I am out of time, and so are we both.

Thank you very much.

CHAIRMAN BAGGETT: With that, we are doing really pretty well. Tomorrow morning we have two witnesses for Audubon and two from National Wildlife. And we aren't going to begin County of Imperial until Thursday afternoon. Why don't we call it a day. Come back and do cross-examination

tomorrow, and we will get through all that so we can get to Imperial on Thursday.

And I think with the schedule it appears we will finish up on -- we should be able to get finished with the cases in chief by Friday --

MR. FLETCHER: I will move my stuff into --

CHAIRMAN BAGGETT: -- after we go through cross tomorrow.

Any other housekeeping?

MR. ROSSMANN: Yes, sir. One housekeeping item that Mr. Fecko asked me to put on the record. Our economics expert, Mr. Spickard, wanted to update his testimony. I distributed it to folks here in facsimile form. They have it. Also to your staff. Tomorrow I will have that in hard copy together with proof of service.

CHAIRMAN BAGGETT: Very good.

Thank you.

Any other questions before we --

MS. DOUGLAS: I have another housekeeping item. I got a little bit overwhelmed with the flurry of new IID exhibits. Maybe if you guys can just get an updated exhibit list to make sure we have that concern and --

MR. OSIAS: Yes. Probably try to E-mail one because I don't have a printer here.

CHAIRMAN BAGGETT: Most of it is rebuttal.

MR. OSIAS: None of it offered in yet, but for identification. That is cool.

CHAIRMAN BAGGETT: One more, Mr. Yates.

MR. YATES: I would like to introduce as an exhibit, Audubon Exhibit 18, which is the joint comment letter prepared on the Draft EIR/EIS.

CHAIRMAN BAGGETT: In advance of tomorrow's --

MR. OSIAS: Why now?

CHAIRMAN BAGGETT: He's up tomorrow morning.

We will accept it. I think you are giving notice.

MR. OSIAS: You just want to give them out?

CHAIRMAN BAGGETT: If you would like give out the draft comments, we will discuss its admissibility tomorrow.

MR. YATES: Yes.

CHAIRMAN BAGGETT: That would be -- it is all going to be part of our record at some point. Pass those out, that would be great.

With that, we are recessed for today, and we are doing well.

Good evening.

(Hearing adjourned at 5:10 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, ESTHER F. SCHWARTZ, certify that I was the official Court Reporter for the proceedings named herein, and that as such reporter, I reported in verbatim shorthand writing those proceedings;

That I thereafter caused my shorthand writing to be reduced to typewriting, and the pages numbered 1472 through 1742 herein constitute a complete, true and correct record of the proceedings.

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on this 6th day of June 2002.

_____
ESTHER F. SCHWARTZ
CSR NO. 1564